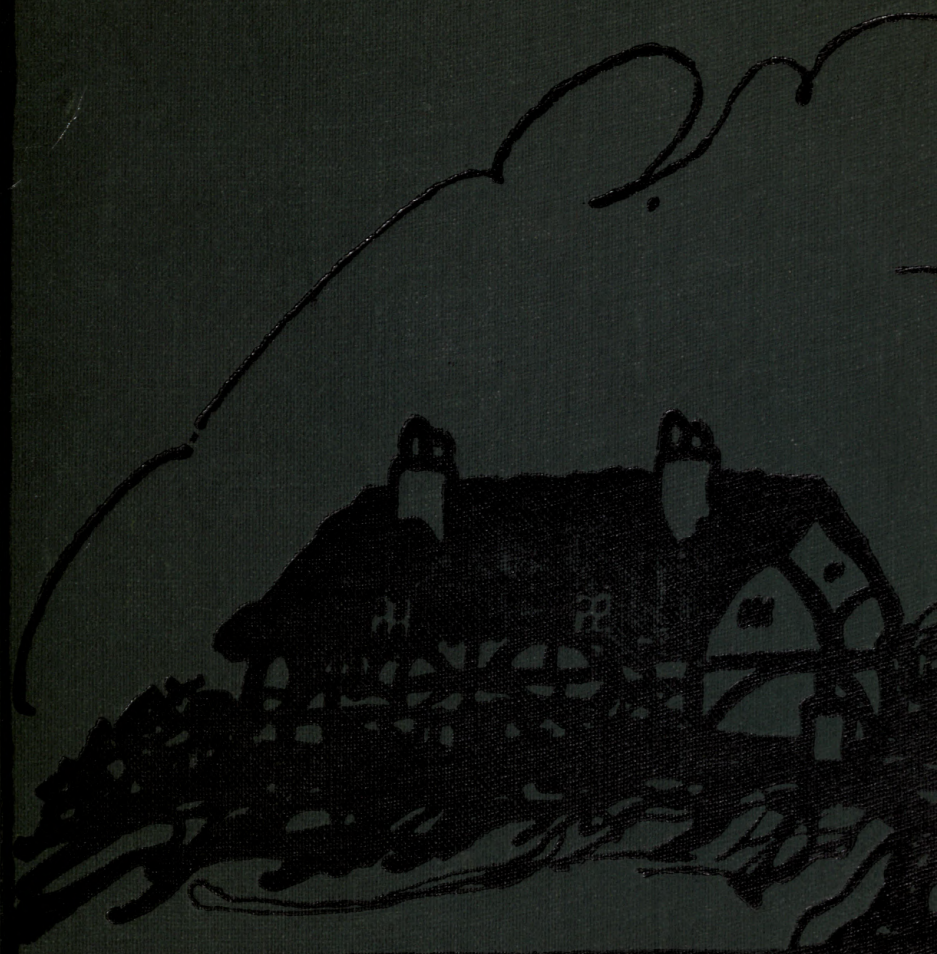


Autumn & Winter



The
English Year



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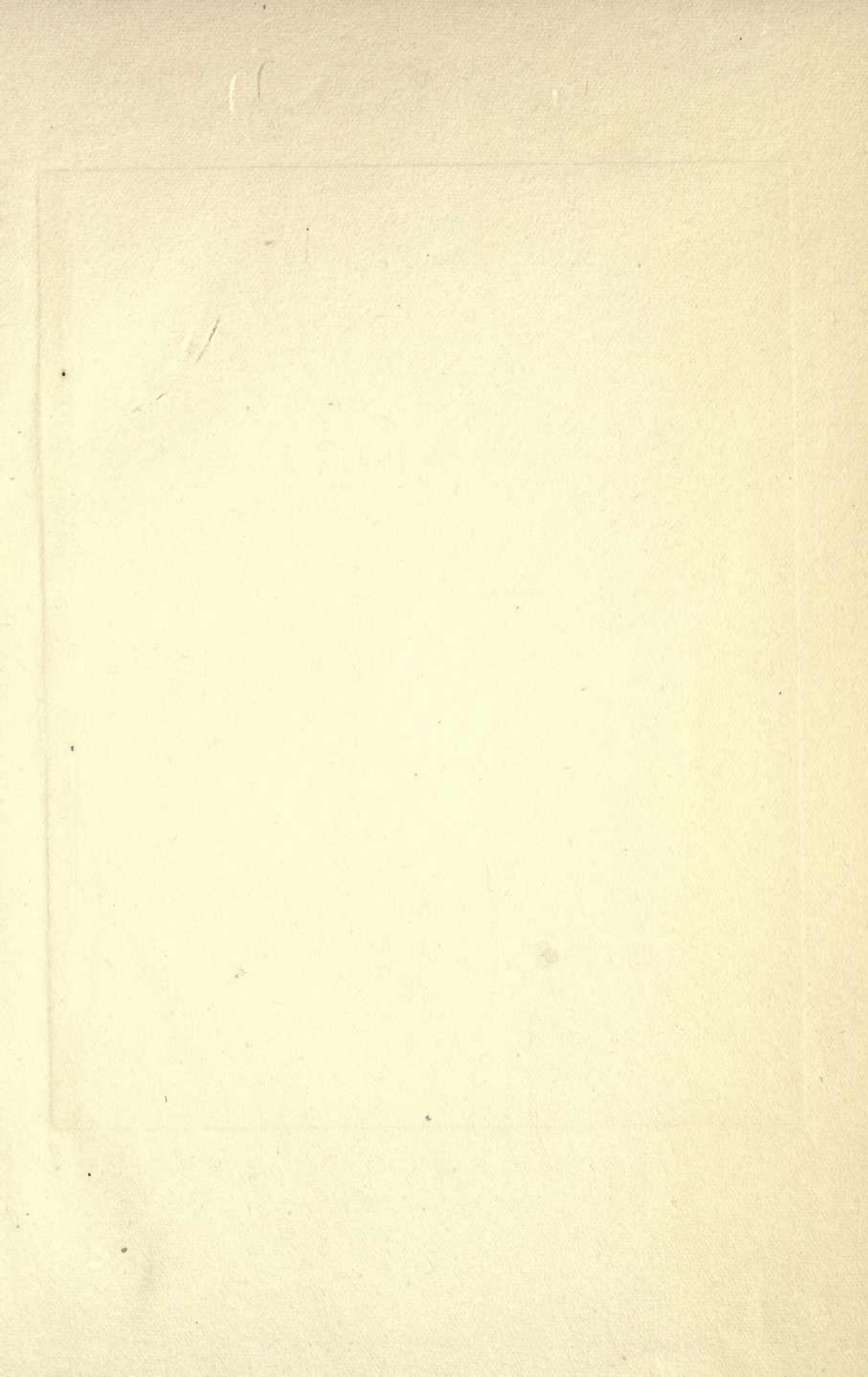
THE ENGLISH YEAR

AUTUMN AND WINTER

PASTORAL LANDSCAPE

By SIR ALFRED EAST, R.A., P.R.B.A.

(By kind permission of Philip de Laszlo, Esq.)





My friend, P. L. Langlois - Georgia, East 1890

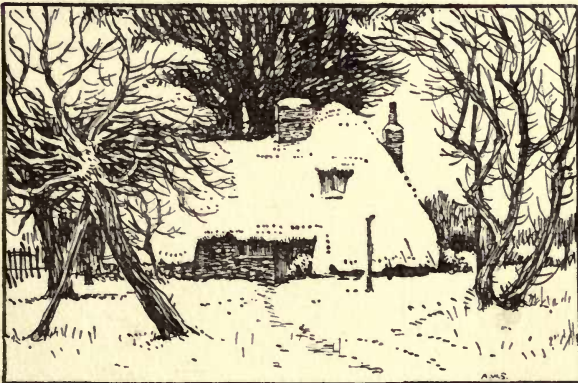
THE ENGLISH YEAR

AUTUMN AND WINTER

BY

W. BEACH THOMAS AND A. K. COLLET

With a Series of Reproductions in Colour from
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THE ENGLISH YEAR

AUTUMN AND WINTER

W. H. RAY, F.R.S., F.L.S., F.G.S., F.Z.S., F.C.S., F.C.S., F.C.S.

THE ENGLISH YEAR
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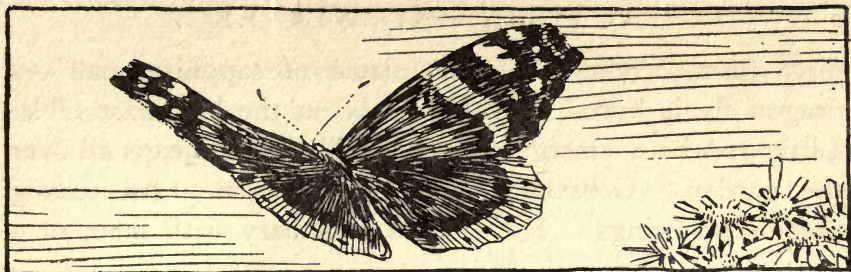
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'THE RESTLESS CHASSÉ OF A RED ADMIRAL'

INTRODUCTION

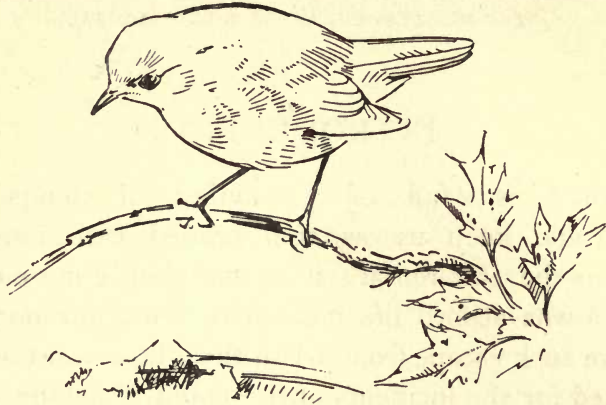
THE world is 'full of a number of things'—things which would keep us as well primed with interest and wonder as the children are, if we had a little more curiosity. As the towns absorb life more and more, our minds more and more seek escape from urban thoughts; and the appetite is whetted for the incidents of the country, for the course of the seasons, for what we call nature. After all, the seasons give us a 'grand tour,' for which we need not travel. The coming of the purple flowers on the elm or the green buds on the quick is never stale; nor the flight of the swallow, nor the turning of the maple leaf, nor the crystals of hoarfrost, nor the restless chassé of a red admiral.

At the sunset we may be daily amazed and never tire of reading, on the scroll unfolded by the winds between earth and heaven,

'Huge cloudy symbols of a high romance.'

Among the deeper moods and ampler spectacles of nature take place a thousand pretty and curious episodes. The hop tendril, as if endowed with mind, bridges a pergola. A dormouse goes to sleep in the beehive. A stoat sleeps in a thrush's nest. Three birds share a nesting-box. An ugly creature climbs a water-lily stem, and from the dull and

dirty form 'come out clear plates of sapphire mail'—a dragon fly is born. A robin feeds on the breakfast table. Little red bees emerge from wormlike earth-heaps all over the garden. Gossamers fall from heaven. An earwig unfolds his wings. Hares take sanctuary with men, or a



'A ROBIN FEEDS ON THE BREAKFAST TABLE'

rabbit crouches at your foot. To the curious there is no end of curiosities. One should go about like Melampus :

'With love exceeding a simple love of the things
 That glide in grasses and rubble of woody wreck ;
 Or change their perch on a beat of quivering wings
 From branch to branch, only restful to pipe and peck ;
 Or, bristled, curl at a touch their snouts in a ball ;
 Or cast their web between bramble and thorny hook ;
 The good physician Melampus, loving them all,
 Among them walked, as a scholar who reads a book.'

This intense and particular delight in the course of the seasons is an English quality above all other qualities. It has been so asserted by a great German historian, and he is right. It was true when Gilbert White began to make Selborne famous ; but the quality grows stronger year by year. Hampshire, Norfolk and Yorkshire were always compact of naturalists, caught into the particular affection for nature

by the peculiar attraction of their surroundings, especially and above all by the migrant birds. To-day every county is full of naturalists; and the tiniest events of the year are discovered by prying eyes and quickened ears :

‘To me the meanest flower that blows can give
Thoughts that do often lie too deep for tears.’

It is so with all of us. Even Kant, that man of books and pure intellect, so felt when he saw ‘the infinite starry heavens.’ Even Napoleon, the mad man of action, so felt when he saw the sun. But beyond this general and overwhelming sense of communion, which no one escapes, the zest of natural history lies in our own discoveries quite independently of the accident whether or no some one has made them before. Sir William Flower said of Mrs. Brightwen, who extracted a new life out of natural history in her garden: ‘What a pity it was that so much was already known about the phenomena of natural history, since it deprived Mrs. Brightwen of the credit she deserved as a discoverer.’

But there are still plenty of discoveries to be made. English naturalists have excelled principally in studying birds, the master interest of field observers. But the area of popular observation widens rapidly. The extreme marvels of instinct are to be seen among insects, especially perhaps among beetles, of which really very little is known. But Fabre, and Maeterlinck, and Tickner Edwards, and indeed Grant Allen, have given accounts of insect life which make the tales almost as exciting as biographies of men of action. And they have proved persuasive.

A quaint sign of the new interest is the production of ‘insect boxes,’ which are set up in gardens just as bird boxes, for the housing of bees, or other creatures, when they

would nest or hibernate. Insects are more easy than other things to observe when we have once found their habitat. They may be kept captive without any feeling that the joy of natural liberty is sullied in any way ; and we may be sure that they behave in captivity as in their proper haunt. We can never tell this either of birds or quadrupeds.

But the real countryman is not an entomologist or an ornithologist, or aviculturalist, or even a zoologist. His interest is not limited to anything within his horizon. It extends to the horizon itself. His eyes are the microscope and the telescope both.

In his work the big and the little touch. Mysticism and Science join hands. His parish is a full and wonderful place, not narrow or parochial. Age cannot wither nor custom stale the various booty of eyes and ears. The tinkle of the thinnest ice echoes in his memory as clearly as thunder overhead ; and the glow-worm pairs with the lightning. One has lain prone some summer day on the hilltop above the sea watching intently the struggle of a little red ant in the grass roots, of which to him each is a great rock of stumbling. Then, altering the focus of mind and eye, gazed at the making of a cumulus cloud over the unharvested sea. The blueness of the sky, the red of the setting sun, have their clear causes as well as their mysterious beauty. They speak prophecy as well as present pleasure ; and the mind may be led from to-morrow to eternity on the prompting of the western wind.

How particular and wide the interest has grown may be judged by a comparison of the novelists and poets of to-day and yesterday. No doubt the most English of poets have been precise enough always. Nothing can prevent Chaucer remaining modern ; nor will countrymen ever forget to take Shakespeare into their company. But with these exceptions

the later writers are incomparable as naturalists. Milton wrote many things which are immortal, about the country; but if 'L'Allegro' was written to-day there would be much quiet criticism of details, amid the chorus of praise. Milton wrote of the moon and the clouds indeed as an observer; but his famous list of flowers is cold and conventional, his allusions to birds wrong, and his mingling of the seasons ludicrous. You will scarcely find in Shelley, who, however, observed clouds more closely than any writer in prose or verse, more closely even than Ruskin—you will find neither in him nor Wordsworth, that supreme poet of country scenes, any real naturalist's knowledge or interest. Though of course poets of poetic value far beyond their successors, they cannot compare with Matthew Arnold, with Tennyson, with Bridges, with Meredith, and above all Lord de Tabley, as observers of nature in the naturalist's sense. Never in any literature of any times have descriptions of nature's details been condensed into quotable words as in Tennyson. What Milton did for wider views, as in the wonderful line describing innumerable English churches among the elms:

'Bosomed high in tufted trees,'

Tennyson did for tiny things as in the line:

'When rosy plumelets tuft the larch.'

But both are surpassed by Meredith in intensity of pleasure in natural history. Almost every other poem bears the signs. His best inspiration often comes from his naturalist's knowledge. 'Love in the Valley' and 'The Sweet o' the Year' have no parallels in literature for the association of almost ecstatic insight into seasonal change. Milton used the telescope, as it were. Tennyson used the microscope. Meredith the unassisted eyes of such a long-sighted observer

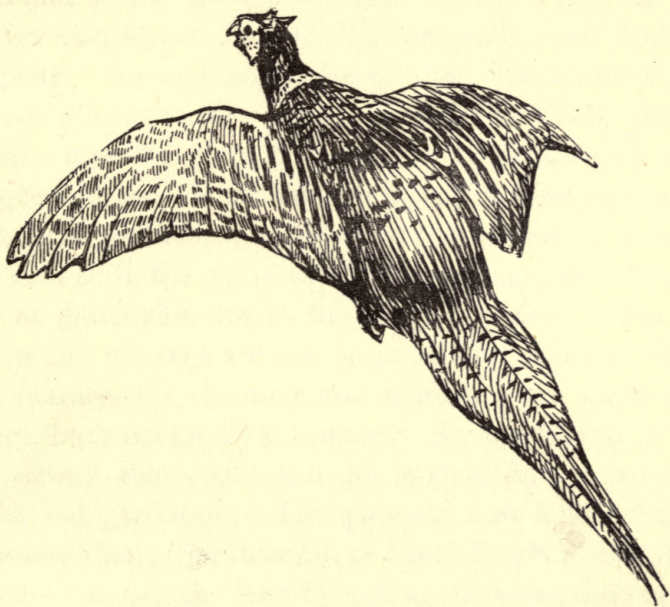
as Mr. Selous, who could change his focus unconsciously from the towering hawk to the toad's gold-rimmed eyes glancing from his hole.

Lord de Tabley, a supreme authority on one department of botany, as well as a fine poet, takes his place along with these. His inspiration was less but his knowledge more. Inhabitants of Cheshire or Lancashire can taste the very savour of their county in his verse; and few writers have taken more zest in the 'Royal aspects of the Earth,' as he names one of his poems. To a Berkshire man it is as good as a visit to Yattendon, that home of poets, to read Mr. Bridges' lyrics, in which every month, almost every week of the year, is compactly described with a lover's zest.

It would be too long a theme to follow out the same contrast in novelists, among whom it is yet more conspicuous. Shelley took his descriptions of scenery in *Alastor*—a debt that few students seem to realise—from a contemporary novelist who had travelled in the Pyrenees. But the two descriptions, both hers and his, are vast and unreal. No better contrast perhaps could be made between the new and the older view than the country scenes of Sir Walter Scott and Mr. Hardy. Sir Walter's scenes are rhetorical appendages, splendid examples of scene painting in the stage sense. In Mr. Hardy the people seem sometimes no more than emanations from the country in which they work and have their being. The two are inseparable, and each studied with equal affection; so that the attributes of moor or woodland take the particular importance of hero or heroine.

But when all is said, Hardy's woodlanders are no more than the proper descendants of Chaucer's pilgrims. Spenser loved the pageant of the year, and drew a pretty procession of the months which modern writers on the circuit of the year have unworthily neglected. Even though Milton, being

wrapped in books and thoughts, mixes up the seasons, and makes a lark into a house-sparrow, he had the country spirit 'as strong as any man in Illyria.' Every Englishman is pulled to love of the earth in this green island where change is continuous, and all the changes bound each to each in a circle of natural cohesion and perennial novelty. Autumn is not sad. Winter is not sad. If we seek the mood of each, it is the same as the mood of spring, for the year is a circle, the circle of our life, to which each season is integral.





AUTUMN

FINE and gentle though the gradations of English seasons are, we also know changes that are sufficiently sudden and complete. In and about September comes the suddenest and completest of all. The harvest falls. Stiff and thorny stubbles take the place of golden acres wonderfully sensitive to light and air. You may see a puff of wind moving across the field as you may trace it over the surface of a level sea. The ears shift the light in wrinkles of laughter as 'numberless' as Aeschylus saw in the tumbling ocean. For a week or two the sheaves are set up in stooks that the ripe grain may mature, for ripening and maturing are quite different though both necessary processes. So much sign is there of the harvest that was. But the modern farmer has left little of the old gradation. The ploughs now follow the reapers so closely that often in south and mid England the stubble is turned over, and the land in tilth again some time before the carrying of the sheaves is complete. Indeed the ploughs and the carts are often in the same field together. One walks in a new country.

Towards the coast the gulls press and scramble so close behind the plough that the ploughman could strike them with the whip, and no sight adds more to the sensation of strange-

ness than these newcomers with their noise and brilliance pressing insistently on our observation. And the drills are not long after the ploughs. Almost before we know it the thin blades of wheat have taken the place of the plough which displaced the stubble, which succeeded the plain of gold. All this may happen, if the weather is all that it should be, within the compass of a month or little more.

So it comes about that autumn more resembles the beginning of a new year than the waning period of an old. We seem to have passed the year's Rubicon in September rather than in January. Autumn is welcomed by some, and by others feared, because it ends a long truce. We may say that the year is divided into two halves. In one half you may kill, in the other you may not. During spring and summer everywhere has been sanctuary. Behind the screen of leaves on tree and bush and lowly plants, within the corridors of corn and among the long grasses, birds and beasts have paired, have nested, have produced young, have trained the young and launched them into the world. Our law has followed nature and our sympathies: it has made the life and homes of the birds sacred, and in a less degree other living things have been left alone to multiply their species. With autumn the spirit of the primeval hunter is revived. The curtain of the sanctuary is worn thin, is torn quite away. We see the hidden mysteries. The frail nest of the whitethroat, that we sought in vain, appears almost aggressively obvious outside the briar bush, as it seems. The golden corridors of the corn are laid low. Roosting birds are cleanly silhouetted against the sky. A wandering spirit comes upon birds and beasts. Foxes begin to lie out in the spinneys and the litters are broken up. The hunt is up. Guns are heard—and the break-up of the homes is complete. All sanctuary is violated. Another spirit prevails.

A good Darwinian prefers therefore to think of the year developing from this point, from general warfare to general peace. First the solitary life of the grown things, then the pairing, then the family. With the rearing of the young the circle is finished. The circle is imperfect enough to show where the circumference was begun, but it is a true enough circle on the whole, as we see it in England, and without too obvious breaks. Spring and summer and autumn and winter run into one another so that at no moment can any one say, the change is here. We may feel spring in midwinter.



'THE FRAIL NEST OF THE WHITETHROAT'

Indeed, if we pay any heed to the foolish almanac, we see the very picture of spring in the lap of autumn. For autumn ends technically on December 22. Yet many a Christmas holiday begins to the sound of spring songs from thrush and missel-thrush, and the tits and robins and wrens—which is almost a complete list of the premature singers. It is usually possible to pick primroses and violets on these final days of technical autumn: and spring is thus actively present though it is a whole season off according to the diaries. Autumn, indeed, is all the seasons, borrowing songs from spring, green leaves and flowers from summer, and snow maybe from winter. One may see September root-fields red with poppies in early October and the ground white with snow on November the

17th. This strange variety, which, however, has seldom very much of winter in it, makes an English autumn like no other season in any other land. Canada, thanks chiefly to her red maple, has a wilder riot of autumnal colour. We have no colouring in England to compare with the low ground bushes whose leaves and berries spread a turkey carpet over the peaty spaces between Newfoundland woods. But in Newfoundland in autumn 'no birds sing.' Nor is any seed put into the ground trustfully until the 'azure sister of the spring shall blow her clarion o'er the dreaming earth.' The glory of an English autumn is that in a very real sense it is also spring. In many ways there is no difference at all, so far as the energy of growth goes, and this is usually taken as the supreme mark of spring. We prefer to sow our wheats in autumn, and they spring up into fresh and lush growth in the 'happy, prompt, instinctive way of youth.' The wise gardener sows his new lawn in September: and sweetpeas, the queen of annuals, will live many weeks longer into the coming year, if they are already plants before winter comes. Sometimes even forest trees, which are most regular in their ways, will put out new leaves in autumn, if any accident has befallen the first leaves. The sap that should fall has the power to rise again. If fruit and berries fall, they fall to sow themselves, and for the most part they begin to sprout. What a yeasty, a lusty spring-time it seems, when we turn up a horse-chestnut from the decayed leaves, and see curling round the polished grain of the case a plump green shoot ready to greet a new year. The very ground itself partakes of an activity that suggests the year's beginning. Those who, faithful to the English games, pursue cricket till it is out of season will find the fields rough with worm-casts. Even Lord's cricket ground, though it is immured by walls, is sometimes almost too rough for

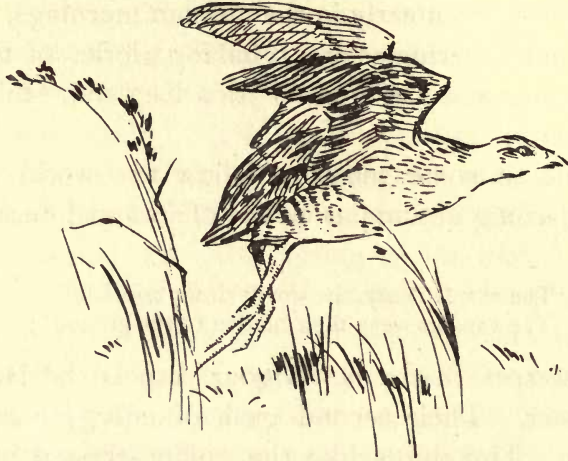
the game when the season is coming to a close. The activity of the worms helps, perhaps, to give the air that suggestive scent which belongs to this season of all seasons. But for the most part the scents of autumn belong to the mists which cover the land like the spirit of sleep before the midday awakening. These mists are integral to British autumns. England has been compared to Newfoundland. In that strange land autumn is not un-English, but the air is singularly bright and clear, even early in the autumn mornings, and you miss these subtle perfumes and breaking glories of the mists that 'half reveal and half conceal' this England, 'this swan's nest in an ocean.'

We must in some measure follow the world and the poets in regarding autumn as a time of loss and decay. It is true that

'The woods decay, the woods decay and fall,
The vapours weep their burden to the ground';

but it is also true that a new vigour dispels the languor of sated summer. Their second gush of energy comes over many birds. Tiny birds like the golden-crested wren, and weak flyers like the corncrake, are possessed as at no other season save spring with that energy of motion which urges them to flights many thousand times more exacting than their normal strength could endure; and for autumn needs some of the birds take on new feathers. The cock chaffinches shine out in colours as gorgeous as their spring robes, for they moult twice in the year, in autumn and in spring. Nearly all birds begin to fatten; they store up a reserve of fat and heat, the universal accompaniment of energy, against the demands of a barren winter. And autumn is a season of breeding. The bees take their marriage flight. The queen wasp, made fertile, takes her last outing before quenching her energy in winter sleep. The moth lays her eggs

beneath the decaying bark, and the single bees, such as *Andrena rufa*, bury their eggs deep in the ground. The closer you look into the events of autumn the more you see how active life is. Energy revives, as in some people who, it is well said, enjoy their 'second spring,' their 'green old age.' Even the leaves are thrust off by an act of energy. They do not fall, as it were, helplessly, but are sucked dry



'WEAK FLYERS LIKE THE CORNCRAKE'

by vigorous action and then tossed away to nourish the roots.

What gorgeous months the autumn shows. We could spare no months more reluctantly than September and October; except for the sense of anticipation the days in many qualities besides their length are the days of late March; and if autumn is spring, it is, in popular idiom, also summer. Our 'Indian summer' when it comes, as it usually comes, is one of the greatest oases of the year, for it comes when the joy of the year seems to have disappeared. The blue and misty air, the soft warmth, the almost springlike feeling, make those late autumn days in America as memorable as

any period of the year. But we have several Indian summers. Our 'St. Martin's summer,' which usually falls rather before the saint's date on November 11th, is an event to expect with pleasure. It sets the thrushes singing, and gives the elm leaves another week or two of life.

One must not altogether deny the melancholy of autumn in which the world profoundly believes. It is true that in autumn as in spring nature distributes and sows her seed, and much of it germinates within a short space, but much also lies dormant. Some of the bulbs and tubers cannot by any persuasion be forced into growth. A potato tuber must go through a proper period of invisible but definite preparation before it can put forth spring shoots. It must progressively mature within itself. It is so with many bulbs. The autumn and the winter is for them a period not of sleep but of something akin to ripening.

Perhaps it is because autumn has so many moods, is an epitome of so much, that it appeals above all other seasons to the poets. The autumn poems are the finest of all. Keats's 'Ode to Autumn,' the 'season of mists and mellow fruitfulness,' is often held to be the very best of all the odes ever written. What pictures of homely England that last verse calls up :

'Where are the songs of Spring? Ay, where are they?
 Think not of them,—thou hast thy music too,
 While barrèd clouds bloom the soft-dying day
 And touch the stubble-plains with rosy hue;
 Then in a wailful choir the small gnats mourn
 Among the river shallows, borne aloft
 Or sinking as the light wind lives or dies;
 And full-grown lambs loud bleat from hilly bourn;
 Hedge-crickets sing; and now with treble soft
 The redbreast whistles from a garden-croft,
 And gathering swallows twitter in the skies.'

In Shelley's catalogue of masterpieces there are not half

a dozen pieces that equal the 'Ode to the West Wind,' which is in essence an address to Autumn :

'O wild West Wind, thou breath of Autumn's being,
Thou from whose unseen presence the leaves dead
Are driven like ghosts from an enchanter fleeing,
Yellow, and black, and pale, and hectic red.'

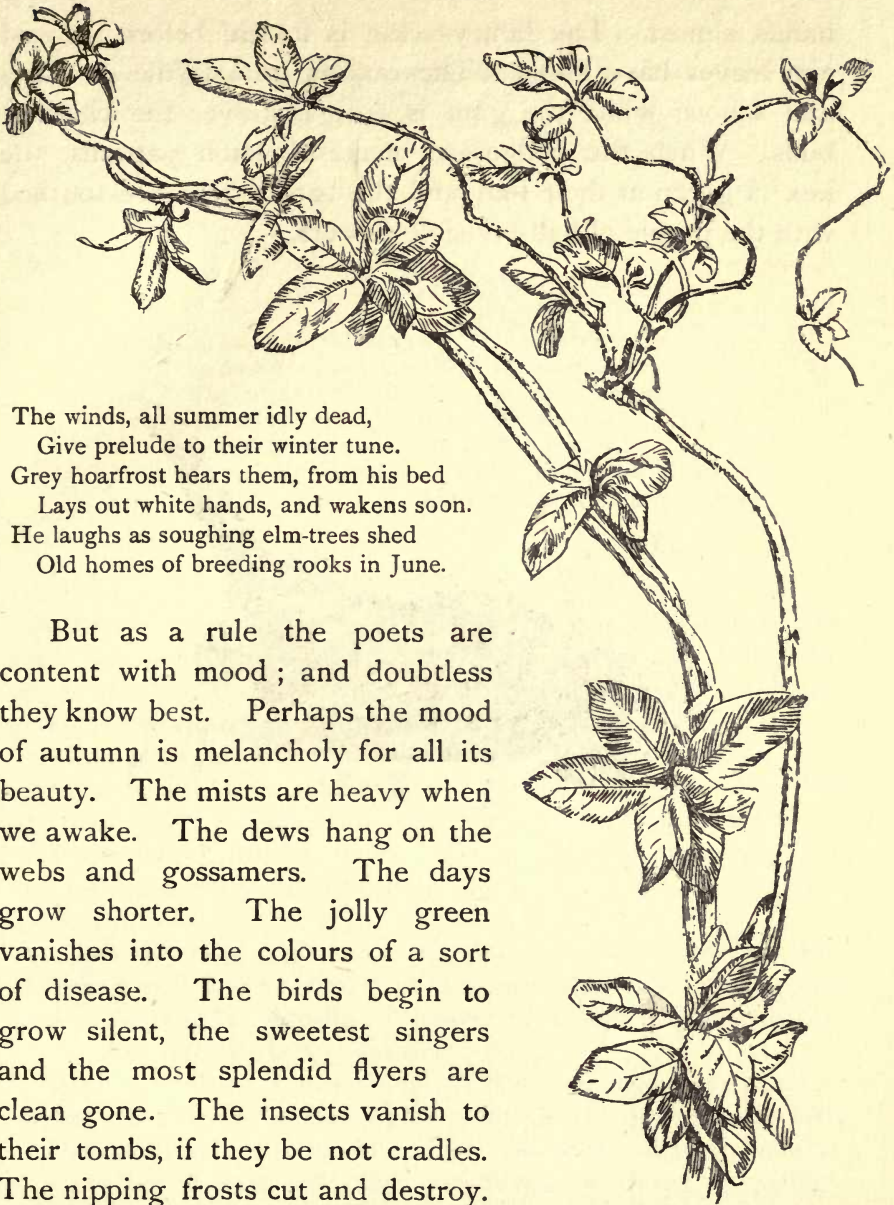
As he recalls these autumn hymns, and puts them in their places among the poets' works, a lover of nature, a naturalist, may feel a sort of pride in realising that the greatest poems of all are evoked by birds. If the Odes to Autumn and the West Wind come second, the 'Nightingale' and the 'Sky-lark' of these two poets come first. As a rule the poets have not been naturalists. A great exception is Lord de Tabley, who has described the country with a fulness and fidelity no one else has approached. His 'Autumn Serenade' is a sort of naturalist's calendar, very much resembling in the fulness of detail Meredith's spring poem, 'The Sweet o' the Year.'

AN AUTUMN SERENADE.

Before the tears of autumn shed
All leaves away at winter's door,
My queen, across the foliage tread
Of yellow gusty woodland floor ;
And watch the squirrel overhead
In stories of her pine-trees hoar.

When only redbreast chirps thee on,
And fingered chestnut leaves are cast ;
And gaudy greenwood gathers wan
On lime and beech, and sickens fast ;
And acorns thicken paths upon,
And shrew-mice treasure winter mast.

When plovers tremble up to cloud,
And starling legions whirl apace ;
And redwing nations restless-loud
Are over every fallow's face ;
And barren branches like a shroud
Blacken the sun-way's interspace.



The winds, all summer idly dead,
 Give prelude to their winter tune.
 Grey hoarfrost hears them, from his bed
 Lays out white hands, and wakens soon.
 He laughs as sougling elm-trees shed
 Old homes of breeding rooks in June.

But as a rule the poets are content with mood ; and doubtless they know best. Perhaps the mood of autumn is melancholy for all its beauty. The mists are heavy when we awake. The dews hang on the webs and gossamers. The days grow shorter. The jolly green vanishes into the colours of a sort of disease. The birds begin to grow silent, the sweetest singers and the most splendid flyers are clean gone. The insects vanish to their tombs, if they be not cradles. The nipping frosts cut and destroy. Winter clearly comes. Yet in tem-

'THE HONEYSUCKLE IS IN LEAF'

perate England this winter is such a poor affair that birds and flowers scarcely dread it. Autumn and spring join

hands almost. The honeysuckle is in leaf before the last elm leaves have fallen. The catkins grow fertile on hazel and sallow, while the gum is still stiff over the chestnut buds. When the hedgerows make skeleton patterns, the kex is green at their foot, and the barest trees are touched with the purple of half-invisible flowers.





SEPTEMBER

'Thy shield is the red harvest moon suspended
So long beneath the heaven's o'erhanging eaves ;
Thy steps are by the farmer's prayers attended.
Like flames upon the altar shine the sheaves ;
And, following thee, in thy ovation splendid,
Thine almoner, the wind, scatters the golden leaves !'
LONGFELLOW, *Sonnet on Autumn.*

THE COUNTRY CALENDAR

SEPTEMBER may be properly regarded as the beginning of the year. It opens the school year, the farmer's year, and, from some points of view, the naturalist's year. A month of very vigorous germination and growth as well as of decay, it is above others the period of change. After the satiety of August, September seems to many of us the most refreshing and the most English of all the months. For every one it has some few days of peculiar charm. It is a busy month for the entomologist, both for rearing caterpillars and seeking pupæ in the crevices of the bark and in the ground at the foot of trees.

The First is recognised as one of the landmarks of the year, because it ends for one large class of animals the spring and summer truce which was first broken on August 12th, and is quite annulled on October 1st. Partridge shooting begins.

September 23rd, Autumn begins ; days and nights are of equal length. The day is the counterpart of March 21st, or Spring the first, and shows many symptoms of spring. But at this autumn equinox daylight and flowers and other fair things are dwindling, though seeds are germinating. The tide of life ebbs and flows in different creeks. Almost the only flower that has not yet bloomed somewhere is the ivy.

The first full moon of the month is known as the harvest-moon.

The mists and vapours which distinguish the coming of autumn magnify and colour it at its rising and setting; and at the zenith it often rides with peculiar brilliance in a clear sky.

September 29th is Michaelmas Day, selected by men as well as birds as a date for 'flitting.' There is a saying, too, 'Plant trees at Michaelmas and command them to grow.'

Up to the second week it is often as warm as August, but the temperature, which remained at its maximum during July and August, usually falls rapidly before the end of the month. At the same time the rainfall is less, except on the West Coast, especially in the Lake District, where the month is one of the wettest.

Average temperature, 57.2° Fahr.

Average rainfall, 2.11 inches.

On September 1st, sun rises 5.14 a.m., and sets 6.46 p.m.



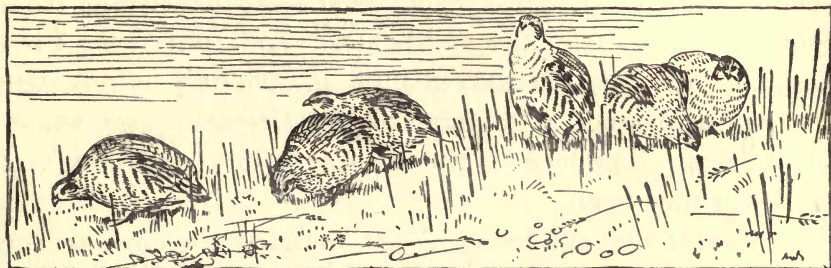
FAMILY PARTIES

'THE First' means always and everywhere in England, September the 1st, not New Year's Day; and its coming seems to interest English people who have never shot off a gun, hardly less than the sportsman. And indeed the First begins a new year, heralds change as definitely as any date that can be named. Our games alter. Cricket ceases, shooting begins. The face of the country is new, and what was hidden is now open.

It is true that the fixing of the limits of the close season for birds, and yet more for fish, has been rather haphazard; and not all the dates are the best dates. Five times out of six September 1st is too early for shooting partridges. The corn is not all cleared; and it 'goes against the grain' in more than the proverbial sense, to be abroad shooting partridges when men are sweltering and 'swinking'—if that fine old word may be revived—about the stooks. The seed clover is just approaching ripeness. Half the purple heads perhaps have been fertilised by the bees, and have fallen limply downwards while the seed is forming, and out of the brown mass the remaining unwedded flowers stand up sparse and erect, like bright-headed pins in a pincushion. Every man who walks through the field scatters a deal of seed, and without exception it is the most valuable crop that grows on the farm. It is among the most beautiful too. There is no scent like the scent of a great acreage of clover in flower.

There is no busier sound, out of a factory, than the hum of bees over it. There is no pleasanter sight to a farmer than a stack of it well got. Of all forms of cover it is the closest and most thorough. The wildest coveys, even the barren pairs, will lie close in it, and the temptation to follow them is more than most sportsmen care to struggle against.

But the cardinal argument against the fixing of the First, as the end of the close season for partridges, and almost all other birds, is that the young are not yet mature. Never a first goes by but a number of 'squeakers' are shot; and



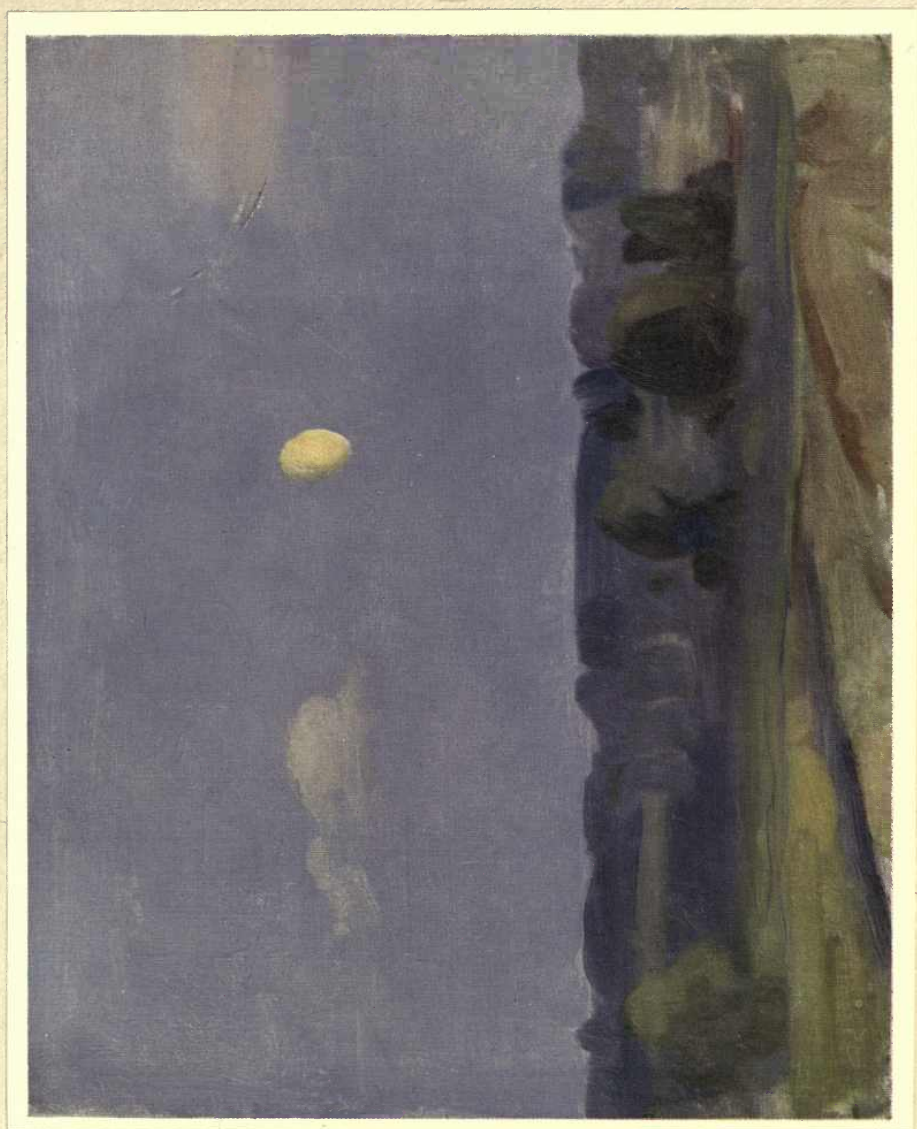
PARTRIDGES AMONGST THE STUBBLES

though of course the good sportsman does not shoot the small bird, the number of them generally seen on the First may spoil the pleasure of his shooting. The Twelfth—just a month later than the grouse—would be a more suitable date in most years. But the First will remain the First. Our English acres are in these days shorn so close that no cover is left on the stubbles sufficient to hide a corn-mouse. The reapers cut close and regular; and there is a tendency to reduce the size of hedges and clear up rough grass fields. Those who would walk partridges and not drive them will get within range of very few birds if they do not begin as early as they may now begin. Even so the birds are wild enough.

For the rest the First is as near to a real beginning of the

HARVEST MOON

By HARRY BECKER



year as any day that could be fixed. On either side of it are two very diverse pictures. Except for the game-birds, the young birds of every species are strong on the wing, are ready to fly overseas, covering a hundred miles at a stretch. But in England, unlike France where any bird is game, we only think of the close season as affecting game-birds; and it is perhaps the most noted of days because it begins a month where a new year opens in the business of town and country, not less than because it begins the break-up of the coveys. The change is very marked in the appearance of all birds as soon as the pairs congregate and the families grow up. But among autumn families that of the partridge is of peculiar interest. There is no bird in Britain, the grouse excepted, which fulfils with such devotion maternal and indeed paternal duties. The very tone of solicitous affection is suggested by the strange ventriloquial call of the birds, heard everywhere towards sunset over English acres. The scattered and broken coveys are hallooing good-nights or summoning the lost members as they collect and prepare to sleep or 'jug' for the night. The call rings over the fields in the ears of sportsmen returning in the dim light most pitifully, most plaintively. Often the birds sleep together in a quite compact mass. One of the reasons why they have almost disappeared from many parts of Wales is that the fields are small, and a poacher who watches the birds may wipe out a covey at one shot. It is indeed a boast among some of these native hunters that not a single bird of a covey has escaped one of these foul shots. The instinct that helps to their preservation against other enemies proves their ruin among men.

What may be called the 'covey system' is very rare among birds, rarer than one would expect. The grouse and the partridge remain in coveys until pairing time, but only

one of the smaller English birds shows this family affection. Of all the pictures of birds that one ever saw, the gambols of a family of long-tailed tits remain most intimately on the mind's eye of the writer. Out of a rough hedgerow rose an old and decaying ash-tree. As one approached its hollow trunk seemed to throw up a slight and sparkling fountain. The drops of water were young long-tailed tits, still small enough to be distinguished from their parents. The sun was bright, having just conquered an autumn mist; and it



LONG-TAILED TITS

lit the colours of these light and tiny creatures into the very tints of a great bubble escaped into the air. They danced and flirted up and down, more in the way of gnats marking time under a hedge than in the progressive ways of birds. When the dance was over and the music stopped they fell back on to the tree as the fountain drops to the bowl. So you may see them throughout autumn and winter moving in a family party leisurely along the hedgerows, always keeping close together, often, as seen that day by the ash-tree, playing together like children. Presumably the prime reason of the family party, as of the great congregation of birds, is mutual help in finding food and protection from enemies.

But these formidable economic reasons are joined, we may allow, with a vital joy in companionship. Birds play as well as eat, laugh as well as fear. Perhaps their start in life tends to comradeship. In the way of snugness and close packing there is no nursery to compare with the interior of that deep beautiful bowl of lichen, moss, and down in which the tit houses its young, who are often a dozen or more in number. You would say the thing were impossible till you handle one of these tits. They make a very fair show of size to the eye, but are in substance imponderable. They are no more than bits of down themselves; and when they first leave the nest, a puff of wind sends them astray like a single feather.

Except in their family affection, no bird could be less like the partridge, which is very heavy for its size, like most birds which either run well or swim well. One cannot imagine the long-tailed tit on the ground. One can imagine the partridge never leaving it. Indeed the French or red-legged partridge very often fails altogether to leave the ground. In districts of heavy clay-land in the midlands, scores of partridges are caught on the ground from inability to raise themselves with the adherent clay that their running exercise had accumulated. On a horse one can hunt them down if the fields are at all big and the hedgerows not over thick, according to a recognised form of sport practised in certain parts of India.

The parental instinct of partridges has been very closely watched owing to the attention of keepers who have to spend much labour in preserving the nests from foxes. It is evidence of the quick observation—for 'love has eyes'—arising from this instinct that for many years it was found impossible to design a nest egg which should deceive the partridge. The birds will sit so close that they will face death in very many forms. In foul weather you may find

them dead on the nest from cold and wet. They have been killed by mowing machines, and the mother bird is not uncommonly caught on the nest by a fox.

In comparing the social habits of birds, no attribute differs so much as the part played in the family by the cock bird. Among some of the terns the whole care of the family is given over to the cock. Polyandry, of a curious sort, prevails. The hen bird takes a new mate and starts a new



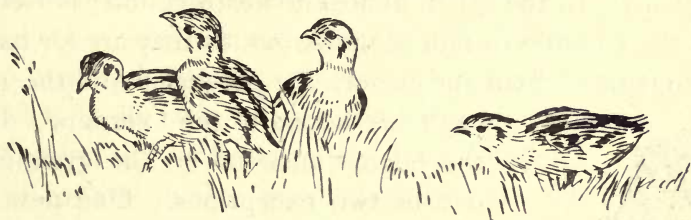
SITTING PARTRIDGE

family—*ab ovo*—before the first clutch is off and away. The father has therefore to serve for both parents. These terns are at one extreme. At the other is the cuckoo; and between them are birds of every degree of family affection. Some help to build; some to brood; some do nothing but feed the mother, surrendering even this duty as early as may be. The cock partridge takes as full a share as any in all duties. He is astonishingly watchful of the family after it has grown up. How often has the bird suffered from rising first when the covey is flushed. Even in their mating there seems to be some stronger, one might almost say more mystic affection than with other animals. It is at any rate certain that scientific breeders, especially in France, have

had quite extraordinary success since they have adopted a principle of natural selection ; and mated their captive birds according to the birds' own sense of affinity. The difference in productivity has been remarkable, as compared with the older way of casual mating.

In their curious breeding establishments advantage has also been taken of the parental zeal of the cock bird in taking care of the covey. If a cock bird is caught up and kept in confinement until a clutch of eggs is hatched artificially or under a hen, he can be quite safely trusted with the youngsters. He adopts them at once, shows every sign of parental fussiness, and when released with this adopted family continues to cherish them as attentively as would their own mother.

It is the custom on some estates, adopting what is known as the Euston system, to put into a wild bird's nest as many



PARTRIDGE CHICKS

as thirty eggs which are on the point of hatching. The bird has previously been supplied with boiled eggs of ancient date to induce her to remain sitting. When this vast family is hatched, both birds will on occasion 'mother' the brood. Keepers have seen the two sitting head to head—a real *tête-à-tête*—to keep the thirty warm. It is an instance of the extreme courage of the bird when the family is expected that she will permit the keeper to push her with a stick from the nest, and will not move off more than a yard or two.

A small personal experience will illustrate the affection of the parents. A whole brood of partridge chicks were found

by some children huddled into the gutter of a Hertfordshire lane. The birds were brought home in a felt hat, were kept for some hours, and then taken back to the place where they were found and put just over the hedge. Almost in an instant the old birds found them, and with a busy chuckle of delight led the family down the gold corridors of the level corn which made their palatial home.

Whether birds suffer pain or pleasure, as we use the words, may be left to theorists. It is certain that these birds during their hours of loss suffered alarm and anxiety as real as reason itself could discover.

With partridges, more clearly than any other bird, you may see from day to day how sharp is the fight with enemies. In any county where keepers are few or incompetent, almost every covey will lose members quite apart from the havoc of the guns. In the quiet, almost domestic countryside of England the enemies cannot be numerous, as they are for example in Donegal or Scotland, where the peregrine and the golden



LITTLE OWL

eagle are added to the 'vermin.' Indeed the enemy must be on the ground, with one or two exceptions. One new flying enemy has been more or less recently introduced. In a Cambridgeshire district, where partridges were very strictly preserved, a full-grown partridge was caught in the open field by a small Spanish owl, one of that exotic tribe imported by Lord Lilford, about which there is much to be said. The little owl in this case, though looking rather larger than its victim, was

in fact nothing like so heavy; and only the hunting spirit, abetted by that marvellous weapon, its prehensile claw, could have accomplished such a David and Goliath feat.

The stoat is doubtless one of the most dangerous enemies, though even his ravages are exaggerated. In our recent experience a stoat, carrying a full-grown partridge as if the weight had been nothing, almost ran into a pedestrian on the open road, before he saw his danger and left the partridge for his enemy's meal.

It has been feared that the partridge was gradually disappearing from England, except where preservation was, if one may use the word, intensive. The stocks were certainly almost annihilated on some of the clay-lands, where shooting is in the hands of the farmers, and keepers are unknown. Probably, too, its multiplication is a little checked by the mechanical precision of farming operations, and the want of good cover, but one favourable season restores the numbers even in some of the less congenial neighbourhoods.

There is one other enemy of the partridge, and indeed of several other birds, which must be mentioned. One windy day in 1911, a body of sportsmen saw a covey, which had not been shot at, fly straight into the wires along the road from Huntingdon to Cambridge; and four fell dead. Along one mile of railway in this neighbourhood, Mr. Alington, one of the greatest authorities on the partridge, calculated that some 100 birds were killed by the wires every year. There are poachers who deliberately make use of the wires. A certain farmer in Westmorland, in his unregenerate days, made many a good bag out of a new line of wires running across the moor. He would wait till dusk when the grouse were jugging; and then flush them from close quarters with his dog. In their alarm and blindness, they would dash straight into the wires, and it was a rare evening when he did not pick up several victims.

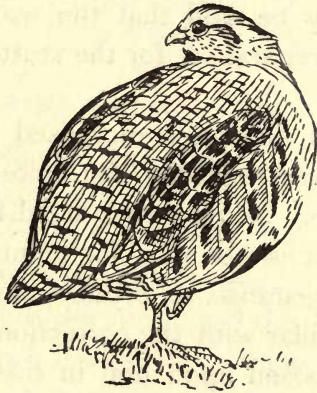
Probably partridges, like wheat, would die out over great areas of the country, if left to themselves, and if keepers dis-

appeared. Vermin, once in considerable variety and plentiful, have been reduced far below the natural level. In 1870 pole-cats were quite common throughout the midland counties. Fifty years earlier than that, they were so common on an estate within twenty miles of the Marble Arch, that the keeper made a small fortune out of a bonus on all he killed. In the accounts of an estate, which was characteristic of others at the beginning of the nineteenth century, the number of stoats killed in the year exceeded the number of rats killed. One would infer from the lists that stoats and weasels were the commonest of all animals on the estate. The wild-cat survives only here and there in the north of Scotland, though stuffed specimens are quite common objects in the country houses.

A near relation of the partridge, with many of its qualities, has, one may say, quite disappeared. Once quail-hunting was quite a favourite occupation in autumn fields in England. The quail did not usually nest in England, but it was a common migrant, so common that the quail-call was an article of commerce. Many sportsmen have in their career shot quail in Britain. Several coveys were seen throughout autumn and winter even as far west as Pembrokeshire in the late seventies. Those who have watched the short low flight of the quail must have wondered that a bird which appears tired by the effort of topping a hedgerow should be one of the world's most famous migrants. The herds cover vast distances; and the armies starting for the return autumn journey over the Mediterranean, south and east, are a marvel worth any man's journey to watch.

But the ground-nesting birds, whether or no they nest in England, grow fewer in England. The corncrake, another migrant that appears scarcely able to raise itself from the ground, has almost vanished from many of its favourite

haunts. Along the valley of the Ouse, twenty years ago, you were seldom out of hearing of the cicala-like call of the corncrake, mingling strangely with the chatter of the reed bunting and the rustle of the reeds. It is now an event if you hear it. Probably its disappearance is due to closer agriculture. One hopes, at any rate, it is not due to the dictum of a famous gourmet, that it is the best bird that comes to table. And one may expect a return both of quail and corncrake. A distinct revival of the corncrake was noticed in Surrey, where several nests were found and protected in 1911. It is a stalwart hope that under proper protection quantities of our vanished birds, from the bittern to the quail, will adapt themselves to new conditions and flourish again almost as they flourished in the days of Hereward the Wake.



PARTRIDGE



THISTLE-DOWN

THE WAY OF A SEED

EVEN the turn of the leaf does not more emphatically impress on us the mood of autumn than the dispersal of seed. It is true that the way of a seed in the air is not autumn work only, for our year is spread wide. Many seeds, including the barren seed of trees, are scattered in spring; then again we may find a real instance of the kinship of the two equinoctial seasons. Seeds are scattered throughout the summer; but it may be said that the work of spring and summer has been preparation for the scattering of seeds in autumn.

Almost all writers who have moralised at all on the vast fertility of plants have regarded the colossal scale of seed production as a waste. Some almost scold Nature for taking this wasteful way. It is not rare for plants, even plants of no great age or appearance, to produce ten thousand seeds. Most people are familiar with the correction that Tennyson's scientific friends imposed upon him in this reference. 'Of fifty brings but one to birth' became in the later edition 'Of myriads.' But the seeds that do not come to birth or are still born are not to be regarded as waste. There are birds and beasts to be fed; and the seeds are the chief of their diet. The squirrels cut open the fir cones. The mice carry loads of small seeds into old thrushes' nests for winter feed. The thousand sycamore seeds that fall and sprout produce

seed-leaves which bestow their riches on the soil. In nature nothing lives only for itself. You cannot regard a tree as a separate being, and say of it that its seed is wasted because the tree sucks no advantage. Half the seeds that



'SQUIRRELS CUT OPEN THE FIR CONES'

fall are no more wasted than the corn seeds are wasted which go to make our bread.

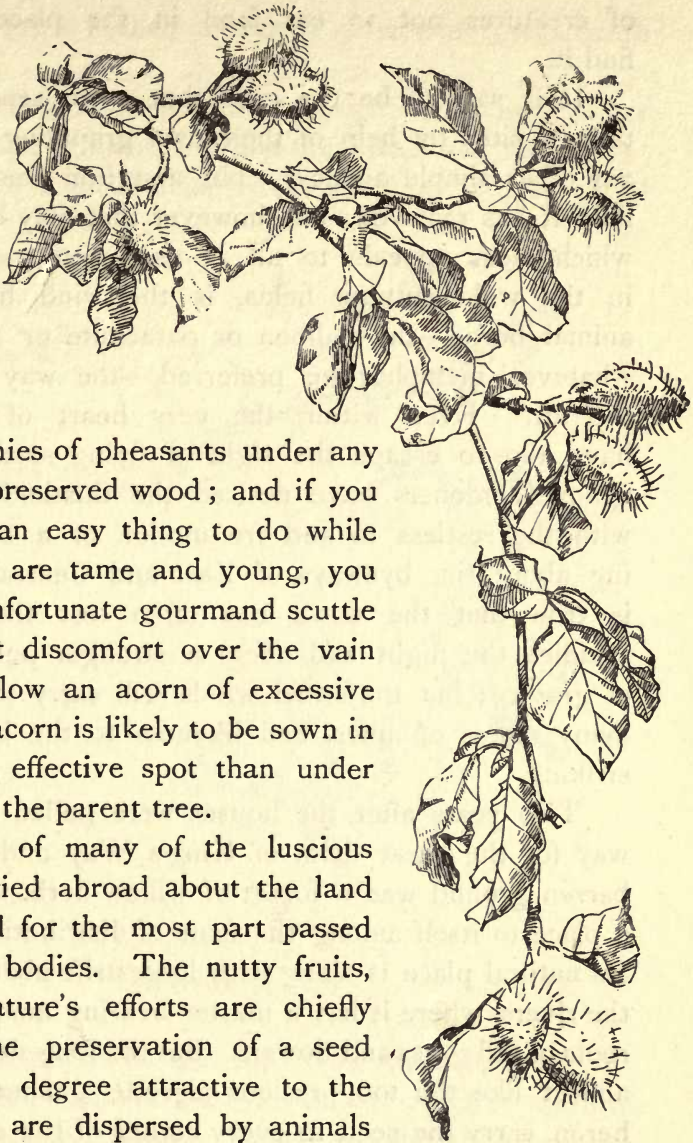
It seems to be a part of the policy of nature to make many seeds which play the double part. They are attached to a pulp which feeds the bird; and the bird later sows the undigested seed which it swallows. In our larger fruits—in plums and pears and apples and cherries—the seed is doubly or trebly provided. Every precaution is taken and attraction provided. The outside is comely and often sweet-smelling. The very flower of the apple is not more odorous and hardly more beautiful than the fruit. Outside it is covered with a close skin that protects the flesh till the chemical processes are complete, till the acid harshness is converted into sugar and attractive salts, till the seeds within

are ripened for sowing. The protection is from the weather only, for the acidity is enough protection from the bird. Colour and scent both reach their highest pitch when the seed is first ready for migration. The kernel of the seed itself is more stalwartly protected. It will need the digestive fluids of the birds, the rains and weathering of winter, and the force of the inner growth, before it responds to the call of spring. The fruits of the wild briar, the may thorn, the yew, the holly and ivy, and scores besides are thus designed, and are all distributed over the country by the animal sowers. Instances are quoted of seeds being so carried over wide seas. But it is as much the part of the fruit to feed as to be carried away, even though we grant the full Darwinian theory that the fruits which have most surely tempted the birds have most flourished. Laws of such double purpose must work roughly, if only one purpose be considered. Perhaps they work roughly from any standpoint. There is certainly one habit of birds which seems rather to strive against the interest of the plant. You may often find little spinneys of trees growing up under the shadow of wide branches which in the end kill them with their shade. Many birds, especially the tribe of thrushes, delight, like the ancient Egyptians, in retirement. They are fonder of no tree than the lime, which sends out spreading and shady boughs within a few feet or even inches of the ground. There is a garden lime in Hertfordshire under which is always to be found a regular nursery of young trees, especially of holly and thorn, the sign of many a hearty meal in the quiet room of the lime boughs. All birds do not take such trouble to escape to quiet quarters. Rooks do not; and so you will find little oak coppices growing up in the most unexpected open quarters. There are some authenticated instances of the work of rooks in sowing acorns; but

more often, perhaps, the seeds are carried by ground animals; by rats and squirrels. Pheasants sometimes do the work. You may

watch companies of pheasants under any oak round a preserved wood; and if you watch close, an easy thing to do while the pheasants are tame and young, you may see an unfortunate gourmand scuttle away in great discomfort over the vain effort to swallow an acorn of excessive girth. That acorn is likely to be sown in a much more effective spot than under the shadow of the parent tree.

The seeds of many of the luscious fruits are carried abroad about the land by birds; and for the most part passed through their bodies. The nutty fruits, in which Nature's efforts are chiefly directed to the preservation of a seed that is in no degree attractive to the eyes or nose, are dispersed by animals of all sorts; but the dispersal has in this case, if one may say so, nothing causal in it; and on the whole little advantage occurs to the species except by a sort of accident, and that habit



BEECH-MAST

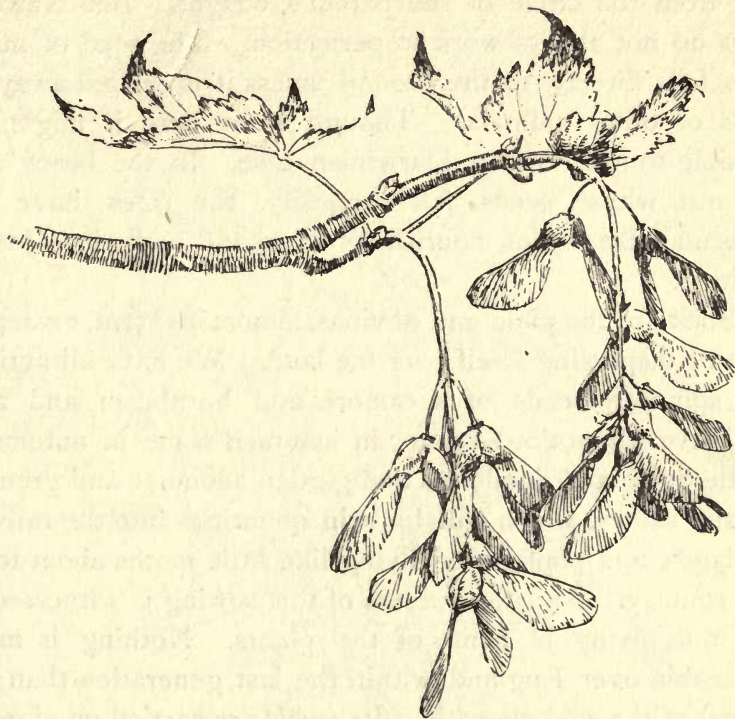
of creatures not to eat food in the place where they find it.

It is said to be the case that more seeds are carried to new sites by help of their own grappling-tools than by any other simple agency. The assertion needs more proof than it has received; but, however that may be, the method which most appeals to all of us, when we are vagrants in the wide autumn fields, is the wind borne, not the animal borne—the balloon or parachute or arrow method, whatever metaphor be preferred,—the way of a seed in the air. Even within the very heart of London you have ado to escape the sight of flying seed. Again and again Londoners have noticed the thistle-down, endowed with the restless to and fro motion of a butterfly, blowing about the byeways of East and Central London. It is true that the down has often lost the seed, which steadies the flight and offers a stronger pull to the force of gravity; but the stiffer winds will carry the fattest seed many scores of miles, and likeness to the balloon is very striking.

Two years after the houses were pulled down to make way for the great delta of King's Way and Aldwych, the barren ground was a forest of willow-herb, which deserves a place to itself among the feats of distribution and vitality. Its natural place is along with loosestrife about the edges of the rivers, where it has a master bearing among the tangled roots of tall grass and flowers. But the long delicate feathers, almost like the too precious aigrette plumes of the white heron, carry the seed to every corner of the continents. In North America and Newfoundland it is called the fire-weed. After every forest fire it is the first thing to appear, covering the blackness and making the sooty ground into a rough garden again. You may see the same resurrection on the

most barren furze bushes of Surrey after some great heath fire.

Some seeds are more active, though their journeys are shorter than the balloons. While the writer was busy about this chapter, in a room close by the seashore in the Isle of



SYCAMORE SEEDS

Wight, a sycamore seed, spinning round with dizzy energy, struck the window with a loud rap, as a cockchafer might in its headlong evening flight. So far had this seed come on the oarage of this aerial screw that one could not find the tree from which it had been launched.

Any one who has seen, as all must have seen, the host of seedlings which spring up in the neighbourhood of a

sycamore, will acknowledge the carrying power of the seed's wings. You will find, except in the very big tree, rather fewer seedlings under the spread of the boughs than just beyond; and if left alone they would very soon grow into a wood. It is good for the tree that the progeny should be free from the circle of the parent's boughs. But Nature's ways do not always work to perfection. The seed of many trees falls directly to the ground unless it is carried away by birds or other animals. Though even here it might be possible to make out a Darwinian case. In the beech and the nut whose seeds fall vertically, the trees have the particular faculty of flourishing in shade and close juxtaposition.

Such are the plain and obvious, almost insistent, examples of seed dispersing itself over the land. We have all noticed the spinning seeds of sycamore and hornbeam and ash. We have all noticed—some in summer, some in autumn—thistle-down and dandelion and garden anemone and groundsel and sallow, which will blow in quantities into the railway carriages, and poplar seed flying like little moths about town and country. And the success of this sowing is witnessed in the multiplying of some of the plants. Nothing is more noticeable over England within the last generation than the spread of the wild clematis. Its seeds are carried on aigrette plumes which float almost horizontally over the ground, where they are rolled along when they fall. So it happens that the seed takes root wherever an obstruction is, and the clematis finds the support it needs. A curious sight in many places is offered by the feathering of the seed over the dome of a leafless tree, that looks from a distance as if covered with white flower. The writer was never more surprised at the effect than walking one late autumn day in a wild park at Clifton. The grass is there dotted plentifully with may

bushes, and when the leaves fall each is re-covered with a white canopy completely enveloping the upper part of the tree. As you came in sight of each tree, in the misty air, you could scarcely believe that they were not themselves



SEEDS OF HORNBEAM

putting forth some unseasonable bloom. The may-trees doubtless had caught with their close boughs the flying seed, which had later sown itself under the desired prop. So you will find dandelions always in quantity under the west side of walls and hedges, where the prevailing wind has sown

them. One wonders whether there is not a regular drift of dandelion eastwards. To come back to Tennyson, who was more interested in the theme, there is no neater description than his of the dandelion head preparing to cast its seed. Like thousands of other children, taking their share in seed dispersal, the little pair in Aylmer's Field amuse themselves by blowing

' From the tiny pitted target,
What looked a flight of fairy arrows aimed
All at one mark, all hitting ';

and he uses the same comparison several times, once in describing the shield of the warrior of the noonday sun :

' As if the flower,
That blows a globe of after arrowlets,
Ten thousandfold had grown.'

What a different manner is his from that much more thorough investigator but less artful writer. In a seed-time poem which did not quite 'come off' George Meredith wrote :

' Flowers of the willow-herb are wool ;
Flowers of the briar-berry red ;
Shedding their seed as the breeze may rule.
Flowers of the thistle loosen the thread.
Flowers of the clematis drip in beard,
Slack from the fir-tree youngly climbed,
Chaplet in air, flies foliage seared ;
Heeled upon earth, lie clusters rimed.'

You may see on the north coast of the Isle of Wight, near Seaview, clematis hanging from the firs twenty feet above your head ; and there realise under the rough experimental words of the poem the truth and meaning of the observation.

No scheme over the whole field of nature is so various

and precisely devised for its object as this dispersal of seed ; and the more closely you peer, the more neat the process seems. The balloons are the most obvious, not the most ingenious. Every gardener, even the children in a garden, notices some of the common devices which are as good as toys. To touch balsam seed, the balsam known as *Noli me tangere*, is an irresistible garden amusement. It is difficult not to be startled, so sudden and forceful is the ejection of the seed. It will fly several yards of its own force, but the complicated spring which throws it out is so sensitive that the trigger, so to say, is very often pulled by any passing animal, which as likely as not will be struck with the seed and carry it any distance. Even cottagers whose garden dimensions are of the breadth of one window, have

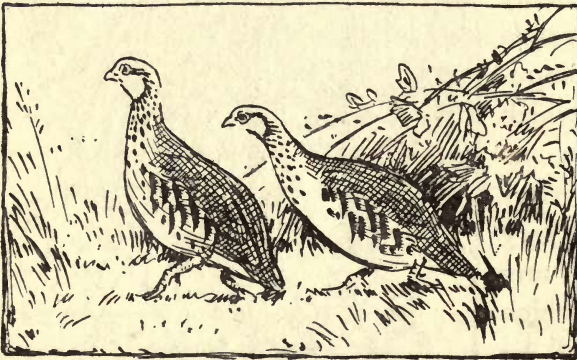


CLEMATIS HANGING FROM THE FIRS

noticed how the long-legged hinge of the geranium, as of the wild cranesbills, heave the seed away much in the manner of some of the mediæval siege engines.

As you look more closely you find that some of the less showy and obvious devices are yet more effective. Walking one seed-time along the cliffs of South Wales, and climbing repeatedly down and up the little crevasses that ran inland, you may see stonecrop growing luxuriantly in many of the minute crevices on the steep rocks. One knows that such is the proper home of the stonecrop, but how in the world did it plant itself there? A German botanist has a theory to account for the ubiquity of the stonecrop. The seeds, as any one may see who has cared to notice, are held singularly tightly in the little cases till the rain comes. To the touch of rain they break; and are carried downwards in the trickle, which makes its way along with the seed into the depths of the tiniest crack.

Darwin himself saw, though he did not make the generalisation, that much seed distribution is purely accidental so



FRENCH PARTRIDGES

far as the artifice of the plant is concerned. He gave a marvelous instance, which has become one of the best known of his minor experiments, of what may be

called the 'muddy boots' system of dispersal. He was given a lump of mud, which that great pedestrian, the French partridge, had collected on one claw in running about the stubble.

From this clod he germinated over 80 seeds. The portage of these French partridges indicates a useful and quite undesigned form of dispersal. The seas and rivers may carry seeds immense distances, even from one continent to another. And here again is accident. But when all is said the special devices of dispersal have a variety and ingenuity, if one may say so, an unlikelihood, which only Darwin's philosophy can explain. The plants, as it were, work for their own preservation. In autumn they prepare for spring, they send out their children into the world, and the variations of those species that have made preparation best have lived and flourished while the others have perished.

In England a number of the forms of device are brought unmistakably to the notice of every countryman. You can scarcely walk through a wood and not carry away the heads of some burr or teazel. The grappling-irons of various shapes with which these are equipped are often so complete that they give the burr-head the feeling of being actually sticky, as if there were some gummy substance over them, though the hooks are of hard, almost polished material. They adhere so closely to any woolly substance, to clothes, or the coat of an animal, that they can scarcely be pulled off. It can scarcely be doubted that such species have flourished beyond others because of the development by slow selection of those individual plants which thus achieved the broadcast sowing of their seed here, there and everywhere. Considerable dispersal may be very necessary to the continuance of a species for other reasons than the mere multiplication of plants in various places, for there is a tendency in some botanical species, as one sees in the fungus fairy rings, to poison, at any rate to exhaust the ground where they have grown for some while. A clover field, for example, needs a seven years' rest before it will grow clover again. Clover,

however, is not a plant that has any method of flinging its seed abroad. Unlike grass seed which is wind borne, the round compact clover seed falls to earth where it is grown.

Some few seeds are pedestrians on their own account; but their progressive power may easily be exaggerated. However, the curious awns of a wild oat do certainly enable it under any stimulus to wriggle itself forward along the ground almost like an animal.

A trick of dispersal, that most country children have noticed, is to be seen and heard, any hot autumn day, among the whins. The pods 'go pop.' In shrivelling under the sun into their blackness, lines of strong tension are developed and the pods burst with a sharp spiral twist that shoots the seeds a yard or two, as far as the more ingenious catapult of the balsam or geranium.

Of the seeds that are dispersed many millions are never sown. Safe sowing is as necessary to preservation as wider distribution. So in the struggle for life some have survived by perfecting a mechanism for covering the seed with soil or pressing it into a congenial crevice. It is worth growing a garden hepatica for the pleasure of watching the insertion of the seed. The stem bends over till the seed is against the earth and then begins a spiral movement which properly corkscrews the seeds into the earth. This sort of device has been developed by rock plants which might waste a dangerous percentage of their seed by the destructive force of gravity if they did not guard against it. Many have noted how the dainty toad flax, with the ivy leaf, feels for cracks and then presses the seed home with a delicacy of touch and a sense for the right spot which a surgeon might envy.

The tricks of sowing and dispersal surpass enumeration if the botany of the tropics is ransacked. The mangroves

develop darts which they shoot into the mud, the water plants send out swimming and sailing seeds and bits of plants which may make great voyages.

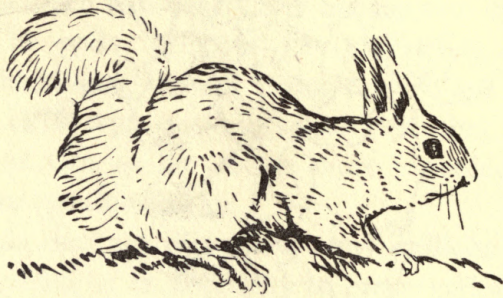
The making and sowing of seed is the greatest task of

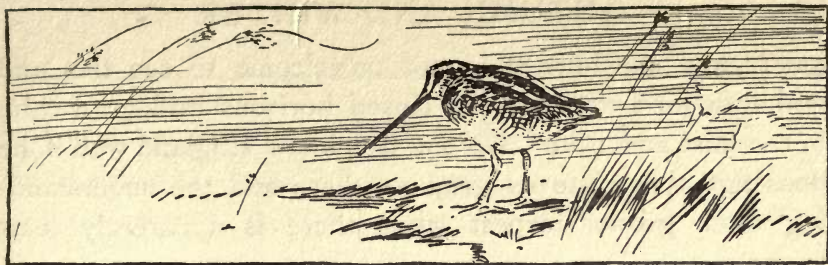


THE IVY-LEAVED TOAD FLAX SETTING ITS SEED IN CRANNIES

nature, and in the stages of the process the seasons are written in characters that we all delight to study. With the coming of autumn the sowing comes to a finish and another work begins again, a fact proclaimed in spacious scrolls over thousands of our fields of England lined with the blades of

autumn-sown corn. The ivy is the only one of our native plants which has not begun to set seed or finished setting seed when September is in its course ; and its seeds will not be dispersed till the pigeons, which now come to us in great flocks on the eve of winter, fall to work on this favourite food.





‘SEASON OF MIST’

Fogs and mists are clouds formed close to earth ; we can see, inversely, that clouds are simply mists at a high level, when we climb among them on a mountain pass. Autumn and winter bring the cooler mountain temperatures down to the plain ; and a thick grey mist with the grass-heads silvery with beaded moisture is equally familiar in August on the mountain-tops, and in November on lowland commons. Though dense fogs are some of the worst features in our climate, the thinner fog which we call a mist often gives the supreme touch of attraction to an exquisite autumn day. The whole year has nothing more delicately beautiful than the slow clearing of the mist on a fine September morning ; and even in November, the sun breaking through the denser vapours on the golden elm boughs makes as glorious a scene as any that summer can show. There is a fascinating sense of mystery in a dense winter fog, either in town or country, which largely compensates for its clinging or choking chill. Birds call close at hand, and we come on them silently and unforeseen ; a sheep coughing or sneezing on the hill-side fills the solitude with unaccountable sounds ; its body magnified in the haze seems as large as a bullock, or, standing endways, takes the shape of a man. There is something restrained and self-sufficient about these covert days which well suits the temperate English climate. After summer's

gaiety and sunshine, it is not unwelcome to see the land withdraw for a while into its closed horizons, and grow calm in the mist and rain. No one can know England well if he does not appreciate its grey weather ; and the understanding often grows deepest when there is apparently least to see.

The connection between fog and cloud is often well illustrated at nightfall on early autumn evenings, when belts or layers of mist hang here and there over the fields at about the height of the hedge-tops. These are simply small stratus clouds, unusually close to earth. The warmed moist air near the surface of the ground is chilled by the cooler upper layers and condenses along the line of contact, forming these flat, hanging clouds. Most day-clouds have more definite rounded forms than these evening layers ; but it is not uncommon to see clouds of the same flat, formless shape hanging in the sky of dawn, where they are soon dissipated by the warmth of the rising sun. Often on autumn evenings fog forms in dense layers close to the ground, especially along the beds of streams. These lower layers are caused in the same way as the hanging belts, but the process is more pronounced. The warmth of day draws up a great amount of moisture from the stream and the wet meadows by its side, which does not condense into visible mist so long as the warmth is maintained, though we feel the air hot and steamy. As the sun goes down, the moisture rapidly condenses as the temperature descends, and colder air from overlying layers and the sides of the valley mingles with it. White fog lies like a blanket in the valley, and does not melt, if the weather remains unchanged, until the sun warms the vapour next morning, and enables it to float invisibly at the higher temperature.

Autumn is the 'season of mists' because of the warmth

STATELY AUTUMN

By SIR ALFRED EAST, R.A., P.R.B.A.



left behind in the earth by the summer sun. For many weeks the store of warmth radiating from the soil tends to raise the temperature of the moist air above it; and fog is formed whenever this moist air at a high temperature is chilled. In winter and spring fogs are scarcer, because the temperature of the earth is lower, the moist air above it is consequently cooler, and therefore cannot undergo condensation so readily on the inflow of chilled air from elsewhere. An approach to the conditions of autumn is seen again in March, when in spells of bright, hot weather there are often thick morning fogs like those of September or October. The sun is then sufficiently powerful to warm the earth well by day, so that condensation rapidly follows when its rays are withdrawn. The morning mists common in autumn often occur most regularly in the finest and most settled weather, which at first sight seems rather a paradoxical association. But in fine settled weather the sky is free from upper cloud, and is as clear by night as by day; and the earth is thus deprived of the protecting blanket which hinders the escape of heat by radiation, and makes cloudy nights warmer than clear ones. Before morning the reduction in the temperature of the earth produces condensation in the moist air above it, and a fog is produced. It vanishes as the sun once more warms the moisture-laden air; but the time comes in autumn when the sun grows too weak to raise its temperature to the required height, and then the fog may last all day.

The clearness of the sky and consequent activity of radiation supply one reason of the greater commonness of fogs in dry calm weather. In autumn and winter fogs are often thickest on the plains and along the valleys on precisely those days when the hill-tops are bathed in sunshine. This is especially the case when the weather is not only calm but

frosty. Fog is favoured by calm anticyclonic weather in other ways. The best conditions for its formation are when a cold current drifts slowly over a moist and warmer layer next to the earth; and this is just what happens when the light, cold airs of a winter's anticyclone wander over the damp surface of the soil. Strong wind almost always dissipates fog, rain carries the condensed particles of moisture to the earth, and moderately warm air does not cause condensation. Strong wind and rain and moderately warm air are all forthcoming in spells of typical cyclonic weather; and thus we find by experience that a wet autumn is generally not a foggy one, or at any rate, that the wet and foggy periods do not coincide. By another apparent paradox, the stormiest winter weather is generally also the sunniest. Stormy weather has spells of clear limpid sunshine between the storms; and in spite of the brilliance of bright frosty days, the total amount of sunshine in a wet and warm winter is generally much greater than in a dry and frosty one. In our climate, frost and sunshine seldom persist together for very long; if it is calm, on creeps the fog, and if there is a strong wind, it brings either snow or rain.

It has been established by experiment that the particles of fog can only form round a nucleus provided by some form of floating dust, or of some of the gaseous products of the combustion of coal or wood. This supplies one very good reason for the density of fogs in large towns, with their myriad chimneys, and the ceaseless grinding and shaking of machinery and heavy traffic. But it is equally true of the clearest country air, and gives a remarkable indication of the abundance of minute floating particles in the earth's atmosphere. Many of these particles are mineral, consisting of dust carried up by storms or ejected by volcanoes; others are vegetable, including grains of pollen shed from

flowers and grasses, and the dust from the bark of trees. The wear and tear of the whole fabric of the earth must contribute to these innumerable floating atoms, which supply the foundation for the fog-clouds.

Land-fogs are produced either by the mingling of two bodies of saturated air at different temperatures, which causes condensation by cooling of the warmer mass, or by the passage of a warm moist current over a cold land surface. The former process is the commoner in the case of ordinary low-lying fogs, though a moist sea-wind blowing against a colder mountain-top often keeps its head wrapped in cloud. Land-fogs, like clouds, can drift to a considerable distance without dissolving, if the balance of temperature keeps their vapour condensed; and in autumn and winter tracts of fog cover estuaries when the sea outside is clear, or even join across the Channel, or drift off-shore in wandering masses. Sea-fogs in the same way often overlap the land. Sea-fogs are formed by the passage of warm moist air over colder water, the chilly evaporation from which condenses the vapour in the air. In regions where a cold sea-current thrusts down into more temperate latitudes, fog is the normal condition of the weather. Off our own coasts, where the water is normally warm, sea-fogs are produced more occasionally. They are commonest in spring and early summer, when the sea still keeps a good deal of its winter chill, and the temperature of the air is rapidly warming. Sea-fogs provide the chief exception to the general rule, that fogs occur in calms or light airs. There may be thick fog along our own coasts with a fresh breeze blowing, while in the seas round the Horn there is sometimes thick fog with a heavy gale. This peculiarity of sea-fogs forms a striking contrast with the way in which an autumn or winter mist will often seem to melt by magic when a light draught

springs up. The fugitiveness of land-fogs is probably due to the constant slight difference of temperatures over any tract of dry land, with its varying elevation and exposure, and alternations of meadow, woodland and marsh. A slight inrush of air from a warmer quarter is thus often sufficient to dissipate the mist. At sea, on the other hand, there is far greater uniformity in the temperature of the whole body of water and of the air which sweeps over it. If the balance of temperatures once sets up condensation, the process will be so general and widespread, that the wind will not affect it. Belts and islands of fog are often to be seen wandering out at sea, hiding distant vessels and releasing them again, and rousing the sirens of distant lighthouses to irregular bursts of warning sound. These isolated volumes of mist are perfect examples of the identity of fog and cloud; they are exactly like the blurred and formless dawn-clouds, though they rest on the sea. Unlike the more widespread sea-fogs, these banks only occur in calm weather, when there is little wind to change their temperature and disperse them.





BUTTERFLIES AND MOTHS IN AUTUMN

IN a fine September English butterflies make almost their most beautiful display. Gone, indeed, are the fritillaries flashing like tawny streaks in the woods of June and July, and the purple emperor soaring round the oaks. But the equally beautiful white admiral has been known to have a second brood in September after a very hot summer; and the gorgeous tribe of the *Vanessæ*—the peacock, red admiral, and their kin—is still almost at its best. Moreover, as autumn begins to set in, and the number of wild flowers considerably declines, butterflies and moths tend to concentrate in our gardens, and thus become more conspicuous. It is a very beautiful and characteristic time in English gardens when the ranks of grave autumn dahlias are bright with peacocks and red admirals, the humming-bird hawk moth comes whirring in the calm sunshine about the heliotrope blossom, and the chestnut vapourer moth tosses across the lawn and away in mad flight among the trees.

All the *Vanessæ* pass the winter in the perfect winged form; and a few of them retire to hibernate before September. The large tortoiseshell is the chief member of this group missing from the September garden, and from the sheets of blue scabious in the dry sloping pastures which attract swarms of butterflies at this time of year. But small tortoiseshells are never more abundant. This is a particularly

widespread and hardy butterfly, as well as a very lively and beautiful one; it scours the Lake Mountains as high as the cloudy hollows where the mountain ringlets breed, and its spiny caterpillars can be seen on the nettles by the doors of the highest Alpine châteaux. In England it is one of the last butterflies to decline seriously in numbers in a series of wet, cold years; and after a fine summer it often abounds by September. This is due to the fact that it normally has two broods, while the other species of its family have usually only one. The first brood emerges early in the summer, and lays the eggs of a second, which hatches towards the end of August; and if both these broods prosper, there is an enormous multiplication of the numbers of the species between the reappearance of the hibernated insects in March, and the hatching of the second brood in late summer.

The peacock butterfly is a larger and statelier insect, with all four wings boldly marked with the striking peacock-eye pattern which recurs so frequently in Nature—as in the peacock, the argus pheasant, and the eye-spots on a leopard's skin. It is interesting to compare the peacock butterfly with the small tortoiseshell, and to see how the pattern of the tortoiseshell seems to be leading up to the perfect eye-spots of the peacock. The upper wings of both have very similar spots of brown and yellow and blue on a deep red ground; but the tortoiseshell just misses the eyelike pattern, while its lower wings, though brighter than those of the peacock, show no approximation to it. Such eyelike spots are sometimes said to be protective; they are supposed to scare away the enemies of the insect which bears them by their appearance of being the eye of some large creature. In certain cases they may very possibly have such an effect; we shall notice the case of the elephant hawk caterpillar a little later,

when we wander out into the lanes. But in the case of the peacock's tail, for example, it can scarcely be supposed that the effect of all these eyes is to multiply terror in the beholder, as well as to fulfil the other traditional purpose of exciting the admiration of the peahen. It is also very doubtful whether its similar markings protect the peacock butterfly. Its chief enemies are flycatching birds; and both the spotted flycatcher and the sparrow occasionally hunt a peacock butterfly across the garden with no sign of alarm, though the butterfly usually escapes from them by sheer size and speed and agility of flight. Protection may be an occasional effect of this eye-pattern in Nature; but it certainly does not appear to supply the main thread or purpose of its development.

The other British *Vanessæ* are the red admiral, painted lady, comma, and Camberwell beauty. The last species is very seldom seen in this country, though it is a common garden butterfly in most parts of the Continent. Its caterpillar or chrysalis has never been found here, though a few winged specimens have been caught when they had apparently only just left the chrysalis.

Probably many of the specimens seen in England have travelled from the Continent; it is certain that large swarms of painted ladies arrive from time to time in this way. Painted ladies are exceedingly common in some summers, and very scarce in others; their numbers are



PAINTED LADY

increased by Continental emigrants, and gradually decline in succeeding seasons. In September 1903 there was a great inrush, and multitudes of this species were seen over the greater part of the country. But the wet weather of the later autumn apparently destroyed the vast majority; at any rate the painted lady was not a common species in the following summer.

Comma butterflies also vary greatly in numbers in different years; but this is due to the character of the



COMMA

seasons alone, without the changes and chances of migration from abroad. The headquarters of this curious species is now in the western midlands; it seldom now appears in the south and east of England, where it used to be fairly common in

favourable years. It is like a miniature and richly coloured small tortoiseshell, with wings of a deeply jagged outline, like that of some thorny shell. It is named from a conspicuous light comma-like mark on the dark under side; but it might well be called the ragged robin, for any one unacquainted with the existence of the species might well suppose that a specimen flying in front of him had been torn and battered through a whole season by wind and thorns and birds. Then the exact symmetry of the apparently mangled wings would strike him with delighted surprise; for it is always beautiful and curious to see the comma butterfly settle on a September marigold, or on the trunk of a sun-warmed tree in early spring, and make the thorny outlines meet above its back.

Most characteristic of all the autumn butterflies is the red

admiral. Its velvety black wings, laced and spotted with scarlet, seem appropriate to the lengthening autumn shadows on the lawn; both alike suggest a presage of the dark days near at hand. Red admirals appear later than most of the rest of their tribe, and retire later in autumn; they can be seen flying on warm sunny mornings as late as November, when no other butterfly but the small tortoiseshell is still abroad. They haunt wild and garden flowers with the peacocks and painted ladies, but are equally fond of the juice of ripe and decaying fruit. Half a dozen red admirals can often be seen bickering with the wasps over the fallen plums and apples in the orchard; and they will flit about the garden walls for plums damaged by wasps and birds, but still hanging, or sail in foraging flight round the heads of the orchard trees. Their airy flight at such times recalls a little the soaring of the purple emperors round the July oaks. Still the wings waver among the hum of many insects under a golden sun; but the admirals fly when the sunshine has the drowsy September haze, and the dews fall early and dense. The potations of the butterflies and wasps are prolonged till after night-fall; a lamp turned beneath the orchard trees in the still darkness wakes a drowsy buzzing from the hollowed apple-shells, and sets the red ad-



RED ADMIRAL

miral creeping slowly over the scented fruit in the dewy chill. The odour of the fermenting juices is heavy even to man; and to the insects it is evidently stupefying. Red admirals

do no appreciable harm to a crop of fruit; their flexible sucker or proboscis takes a minute liquid draught where birds or wasps or weather has broken the skin. Even in the larval stage most of the *Vanessæ* feed on thistles and nettles; indeed, with the exception of the two cabbage whites, no butterfly does harm to farm or garden at any period of its existence. The destructive caterpillars are those of certain moths.

One striking feature of the *Vanessæ* is their possession of only four active legs; the front pair are dwarfed and apparently useless. So far from this making them feeble or awkward, these butterflies seem to walk more gracefully and lightly on two pairs of legs than other butterflies on three. Another peculiarity is the great contrast between the brilliant patterns of their wings above and their duskiness beneath. The under side of the red admiral has a delicate damask pattern of pink and grey, and the painted lady is a little gayer. But the tortoiseshells and the comma are almost covered with dense dark streaks; and the under side of a peacock is as black as a piece of charcoal, or the under side of a dark tree fungus. This is a case in which the protective effect of their markings can hardly be doubted. Peacocks and tortoiseshells naturally hibernate in heaps of brushwood and old hollow trees, hanging with folded wings and antennæ hidden between them. Against their dusky background their under sides must often be practically invisible. The under side of the peacock in particular is amazingly like the slightly ridged surface of old blackened wood. Sometimes these butterflies hibernate indoors, creeping into dark cupboards or behind bookcases. In such places they seem to have no instinct of settling on a surface of like colour; they will go to sleep for the winter on a light picture-frame, or buff distempered wall. Brimstone butterflies, on the other

hand, seem to have a distinct though partial sense which leads them when flying about by day to settle on yellow flowers and dead leaves, chips of yellow wood, and other objects which help to conceal them. They do not always do this; they will feed in spring, for example, on purple vetch, and on dahlias of many colours in the autumn garden. But the habit is sufficiently marked to be interesting and significant. Sometimes they seem to hibernate in thick heather, from which they may sometimes be disturbed in October and November; and among the dark-brown heather-twigs their greenish-yellow under sides cannot help to conceal them, unless, as is possible, they serve to imitate a yellow leaf of sorrel, or sallow, or some other heath-growing plant. But they have lately been found hibernating in quite a different situation—among growing ivy leaves in a hedge; and there their hooked greenish-yellow wings gave a striking imitation of the under sides of the pointed ivy leaves. The small pale spot in the centre of the wing precisely imitated a fleck of decay on the leaf. The two species of clouded yellows have a similar spot; and although their special place of hibernation is not known, it is highly probable that they hide in some spot where they imitate pale yellow leaves.

Clouded yellows are as erratic in their appearance as painted ladies, and for the same reason. Our British supply is periodically reinforced by immigrants from the opposite shores of the Channel; and the number of their descendants depends on the weather for the next year or two. There are two species, the pale clouded yellow being much scarcer than the common one. They are most plentiful in Kent, where the migrants from France most thickly settle; but in some years they are fairly general in the south of England in late summer and early autumn. The common species is of a deep saffron tinge, a good deal richer than the colour

of the male brimstone or his moonlight-coloured mate. They are too restless to haunt gardens like the *Vanessæ*, which love to return over and over again to the same perch. Clouded yellows are usually seen in rapid though dancing flight across open meadows, or the wide vetch and clover fields that skirt the downs. It is this restless habit which scatters them far and wide across the country by September, when there has been a migration from France in May or June.

Common blue butterflies are still plentiful at the beginning of September, but become scarcer as the month advances, and have vanished by the end. They too are field rather than garden butterflies; but when drought parches the meadows, they visit gardens for the sake of the moisture of the watered lawns and beds. But they are not happy in a small area, and after coursing to and fro for some time, vanish again into the dry land outside. With them comes the small copper, which is commonest in dry heathy fields, but wanders far and wide. It has all the spiritedness which is associated with red colouring in many different forms of life; a small copper will always be sparring in the air with the blue butterflies that haunt the same field, or with others of its kind. Small coppers are often abroad very late in the season. After a fine summer they are often seen on bright October days, and sometimes linger into November. In damp summers they produce two broods, but in warm seasons three or even four; and it is these latest broods which haunt the autumn pastures and woodsides among the last of the thistle-down and the faded seed-heads of the knapweed. In hot seasons the last brood of caterpillars pupate and emerge as butterflies instead of hibernating; then the butterflies lay eggs, and the young caterpillars hatched from them hibernate instead of their parents.

Gatherings of autumn butterflies are reinforced by two conspicuous species of day-flying moths. The humming-bird hawk moth can be seen all through the summer half of the year; but it becomes much more abundant at the end of summer and the beginning of autumn, when the year's brood appears before hibernating. It is a very strange and conspicuous insect, as it hangs, whirring like a humming-bird, at some blossom while it sucks its nectar with its long unrolled proboscis. Its fore wings are smoky grey, and its hind wings rich orange bordered with brown; it has also large parti-coloured tufts of down about the tail, which it spreads out while hovering so as to help it to float in the air, like the membranes of a flying squirrel. Sometimes it rests on hot brick walls, and sits fretting its wings together in the sun; when startled on such a perch, it instantly flashes away in a soaring curve. The second common day-flying moth that haunts flowers

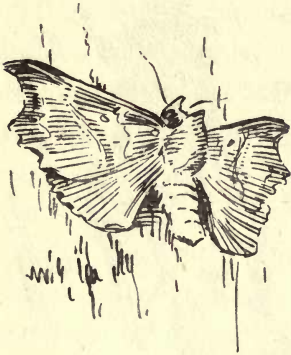


SILVER Y MOTH

is the gamma or silver Y. It is a small moth with long powerful fore wings, marked with a white character resembling the Greek and English letters after which it is named. The gamma is also a swift flyer, and occasionally hovers at a flower something in the manner of the humming-bird hawk; but it is impossible to mistake the two. The hawk moth looks much larger in the air, and its flight is far more buoyant and commanding; when it hovers at a flower its wings vibrate in a rapid blur. The vapourer moth generally appears in September, though in years when it is abundant it can be seen all through the summer. It is sometimes very plentiful in the London parks. The male is con-

spicuous with its bright chestnut wings and capering flight in the sunshine. The female is wingless ; she sits on the trunk of a tree, lays her eggs and dies, often not moving more than a few inches from the web of the cocoon from which she emerged.

The variety of night moths diminishes as September draws on and leaves the life of August behind ; but a few striking autumnal species now first appear. Most conspicuous is the red underwing, which is not uncommon in the south of England, and is often attracted by lamps in rooms with open



HERALD MOTH

windows, or is found resting on walls in passages, to which it has also been drawn by lights at night. It is a large moth with four wings of mottled and banded grey, and hind wings of crimson, striped with black. Another handsome and much commoner moth is the herald, which can easily be recognised by its stout body, the irregular outline of its fore wings, their conspicuous white lines and orange blotches on a grey ground, and above all by its fondness for sheds and houses. Very occasionally, the herald can be caught feeding on flowers or on entomologists' sugar after dusk ; but for every one insect seen flying out-of-doors, probably a hundred will be found resting in dark corners. This curious passion for hibernation seems to seize them almost as soon as they emerge. The fretted wings, painted with autumn tints, doubtless mimic a crumpled autumn leaf when the herald hibernates in natural surroundings, though they make it a rather fantastically conspicuous moth when seen in a storehouse or stable. Several other moths appearing in autumn are coloured like autumn leaves ; common examples are the August and September

thorns and the sallow. But these cannot be claimed confidently as examples of special protective colouring, for an equally autumnal-looking series could be picked from most groups of moths in spring and summer. On windy days in October the threshing beech boughs often send forth large numbers of mottled umber moths—a small species of the frail-built geometer tribe, with upper wings freckled and banded with brown, and under wings of pale freckled grey. This rather dull-looking little moth is chiefly interesting because it is an old friend in a new shape. It is bred from the thin reddish 'looper' caterpillar with buff or yellow marks along the side, which is always plentiful on trees in May and early June, and is excessively abundant in dry springs. From June to October it has been a chrysalis; and now it reappears in its final form to lay eggs and produce small caterpillars which will sleep through the winter. The umber moths which flutter from the beech boughs are the males; the females are wingless, like those of most moths which emerge in the stormy autumn and winter months.

Little is seen of the perfect moths and butterflies as they go into hibernation, except when the herald or the peacock is found resting inside some building. But the descent of many kinds of caterpillars from these trees to the earth is a characteristic feature of the September days. When the first curled leaves of the elm and lime begin to drift down on the dry surface of the lanes, the larvæ of the lime hawk moth come down to turn to pupæ in the earth. They are often commoner on the elm than on the lime. The full-fed caterpillar can be seen crawling down the trunk of the tree, or creeping slowly across the road to find loose earth in which to burrow. Its resemblance to the curled autumn leaves is very remarkable, especially to those of the elm. Both lie on the surface of the road as yellowish-green cylinders, about two

inches in length, with a point projecting at one end : and both have oblique stripes along the sides. The conspicuous horn on the tail which is the badge of the hawk moth larvæ closely imitates the stem of the leaf ; the rough shagreen-like skin of the caterpillar mimics its colour and texture ; and the stripes on the caterpillar's flanks reproduce the lateral veins of the leaves. Only on a close examination is it likely to be noticed that in the elm leaf the lines of the leaf and the stem run parallel, while the horn of the caterpillar runs crosswise to the stripes on its flanks. This mimicry may help to protect the lime hawk caterpillar from the hedgehogs, shrews, moles and mice which forage along the surface of the ground in the September nights.

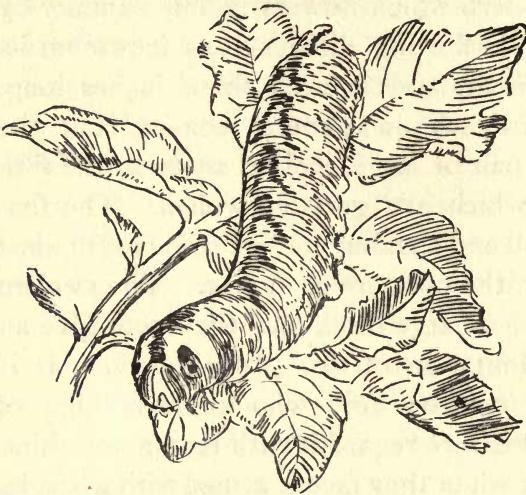
Similar concealment is afforded by their horns and stripes and varying shades of green to the caterpillars of several of the other species of hawk moth, which grow fat and descend to earth about the same time. The privet hawk caterpillar is a handsome great creature, nearly four inches long, of a beautiful shade of apple-green, with mauve and white lateral stripes. It feeds on holly and guelder and other shrubs, as well as on privet ; and in spite of its large size, it is surprisingly inconspicuous among the leaves. Its green blends with the general shade of the foliage, its stripes imitate their general markings, and the horn very fairly represents a spine of holly or the privet leaf's pointed tip. The resemblance does not bear an exact comparison in detail ; it is not even so close as that of the lime hawk to the withered elm leaves ; but on the whole it is very effective. There is a specialised resemblance, again, between the grey-green of the poplar hawk caterpillar and the pale foliage of the poplars and willows among which it feeds ; and the blue-green skin of the eyed hawk caterpillar is surprisingly hard to detect among the pale under sides of a spray of apple leaves, even though we

know it is there. None of our English birds seem to attack these large hawk moth larvæ when full grown; but the mimicry may none the less be of use to them in their earlier stages of growth.

The pattern and colour of these species of hawk moth aim at concealing the caterpillar from view; but the markings of elephant hawk caterpillar seem designed to make it look terrifying. The large elephant hawk feeds chiefly on the common purple willowherb which flowers in late summer by lakes and streams, and in flowing ditches; and it reaches its full growth in September, and is then three inches long. It is mottled greyish-black in general colour; but the peculiar feature is the pair of large eyelike spots on the fifth and sixth segments, which are greatly swollen. The first four segments are small and slender, and are retracted against the fifth segment when the creature is at rest. The swollen segments then look like a large head, and the spots give an extraordinarily vivid imitation of two glaring eyes. It is hardly surprising that country folk who know nothing of the life-history of the creature regard it with terror, and think themselves courageous when they face it armed with a spade. As it does not aim at concealment it does not need to be of the same colour as the leaves of its food-plant; and it is therefore nearly black, so that the effect of the glaring eye is intenser. This dark colour and the thin trunklike segments in front of the pretended head have given it its English name of elephant hawk.

A better known object of terror is the death's-head hawk moth, and to a less extent its caterpillar, both of which are often found in potato-fields when the crop is dug in autumn. The death's-head is irregular in its habits, sometimes passing the winter as a chrysalis, and sometimes hibernating in the perfect state. Strange and sinister-looking as is the skull

depicted on the moth's thorax, it is, of course, a purely chance similarity. The picture of the death's-head is alarming only to mankind; and it is impossible that the moth's markings should have been developed in the comparatively short period of man's existence as a formidable species, and as the result of any struggle between them. The death's-head mark is in fact not always a protection; for the anxious potato-lifters make an end of the menacing creature with a



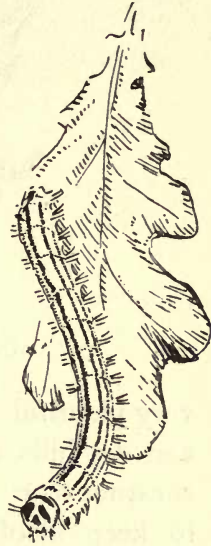
CATERPILLAR OF DEATH'S-HEAD MOTH

fork. Another uncanny feature of the death's-head hawk is its unique possession of a voice. Alone among our moths and butterflies, it can squeak. Both the winged insect and the pupa can make this sound; and it is not known how they do it. The moth has been thought to emit

the sound by the friction of the thorax against the abdomen, after the fashion of some beetles, or by forcing air through the thorax, head and trunk. But the fact that the pupa can also emit the sound makes it very unlikely that the latter explanation is correct. The mail of a pupa fits too close to make any such passage of air seem possible; but it can writhe its abdominal segments, so that the sound seems more likely to be produced by friction in that part of the body.

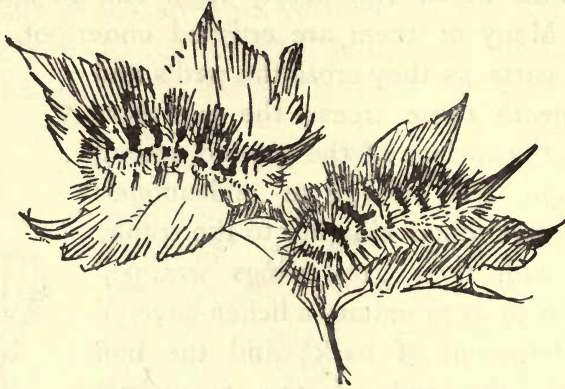
The large greenish caterpillars of the buff-tip moth are often seen in late August and September as they descend

from the boughs where they have fed in a numerous colony. They strip the twigs almost bare by the time that they are full-fed, when they are about three inches long. Unlike the hawk moth caterpillars, they are thinly covered with short hairs; and they are easily identifiable by the narrow black parallel lines which run nearly from end to end of their bodies. Many of them are crushed underfoot, or by the wheels of carts, as they cross the paths and roads beneath these trees; the survivors pupate on the surface of the ground among the herbage, and emerge at midsummer. Then they are found clinging to the trunks of trees, with their grey wings wrapped round them so as to imitate a lichen-covered stick or fragment of bark; and the buff splashes at the end of the fore-wings resemble the paler surface of broken wood. Yet another method of protection is illustrated by the handsome caterpillars of the pale tussock moth, which appear abundantly at hop-picking time in September, and are known in Kent and Surrey as hop-dogs. They are bright green, with vivid black transverse bands, and five large tufts of yellow hair, the last of which turns backwards like a dog's tail. These conspicuous tufts serve as warnings to birds to let their wearers alone. Cuckoos are the only birds which habitually eat large hairy caterpillars; for all other species their bristles apparently make them an unwholesome diet. It must thus be a considerable advantage to a caterpillar to be conspicuously protected in this way; and the hop-dog is one of the best examples of this device. It spins a loose cocoon among leaves or other herbage, and



CATERPILLAR OF THE
BUFF-TIP

spends the winter as a chrysalis, emerging in May. Many other caterpillars leave their food-plants as the sap goes out of them and the nights grow cold, and hibernate in the earth, or wrapped to some twig or bough. The most conspicuous of this group of caterpillars is that of the fox moth, which is



CATERPILLARS OF THE PALE TUSSOCK MOTH

very plentiful in August and September on heathy commons and dry hills, and readily attracts attention by its thick soft chestnut hair. Though its thick mantle serves to warn birds to keep aloof, it is no protection against ichneumon flies. These are some of the most dangerous enemies of moth and butterfly life. The flies pierce the skin of the young caterpillars with their slender ovipositors, and insert a number of eggs. The larvæ feed within the larger caterpillar's body, and eventually kill it. Sometimes the victim turns duly into a chrysalis, but a troop of winged parasites emerge instead of the butterfly or moth. Other caterpillars waste away before they can change; and we sometimes see the shrunken body of a fox caterpillar lying on the grass with the white oval pupæ of the ichneumon fly bursting from its skin. The delicate callousness of this process is less objectionable when the victim is one of our own garden pests. When the last



GOLDFINCHES

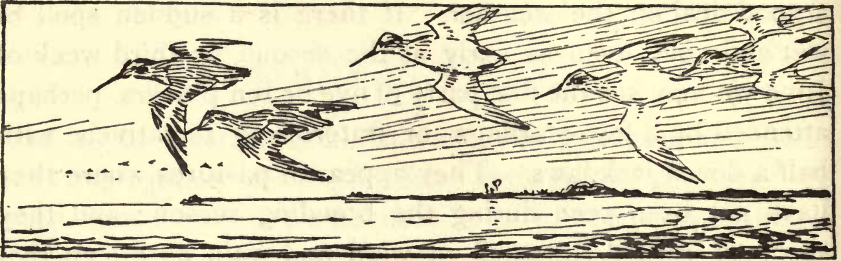
BIRDS IN FLOCKS

ONE of the most characteristic signs of gathering autumn is the congregation of many kinds of birds in roving flocks. A gregarious existence seems natural to the majority of birds, except in the crisis of the nesting-season, when they are driven asunder partly in order to have sufficient territory for the collection of food for the hungry young, but mainly to satisfy the overmastering instinct of jealous independence which most creatures feel with regard to their mates and young. At any rate, with most of our familiar English birds the season of separate households and a settled domicile lasts for little more than a third of the year, and for nearly two-thirds of it they roam far and wide in company with others of their own and kindred species. As surely as we see in September the first leaves dropping from the lime-trees, and the first golden boughs shining in the crowns of the elms, we hear the flocks of linnets piping in the cornfield hedgerows, and the mixed cries of the jackdaws and rooks and starlings as they rise in a loose cloud from the tanned and tufted pastures. The birds' family life is merging day by day into the communal existence of the great winter packs. Species forgothers with species, and a different conception of

existence seems to spread among them as the vital sun declines.

Though this change becomes unmistakably conspicuous in September, its beginnings are visible long before. Just as the new song of the robin and the new thrusting of the leaves and buds of the primrose seem to reach forward from autumn to spring, so even in June or early July the first gathering of small flocks and parties of birds gives a sign of coming autumn to the watchful eye. The date of the change depends a good deal on the weather. If there is a sudden spell of wet and cold, even as early as the second or third week of June we may see the first party of five or ten plovers, perhaps attended by a few starlings, or fraternising tentatively with half a dozen jackdaws. They appear in pastures where they have not been seen during the breeding season ; and they seem to regard the spell of wind and rain as a sign that autumn is already coming, and that the time for the old kind of life is past. Once they have begun to pack, they do not break up into family parties, or attach themselves definitely to a single spot, even though, as often happens, the weather soon turns fair again, and the hottest part of the summer is still to come. The casual association of a party of plovers with one of jackdaws or starlings may be merely the accidental consequence of meeting on one feeding-ground, and species may part company from species at a slight alarm. But once the instinct of flocking is reawakened, it does not slumber ; and week by week the wandering parties of rooks, jackdaws, starlings and plovers become more frequent in the pastures, and on the shorn hayfields, and in the green salt marshes by the sea and tidal rivers. Early in August wood-pigeons begin to appear in these mixed flocks ; they are later breeders than the other species, and are busy with eggs or young until long after midsummer. Curlews which have

bred on inland moors begin to gather on the marshes outside the sea-wall, and flights of dunlin and redshank pipe and wheel across the ooze-beds threaded by the tide. Sparrows form flocks in July, and migrate from towns to feed on the ripening grain. As the berries ripen and the corn is carried, the silent woods are quickened with the cries of wandering titmice, and flocks of linnets begin to mass on the weed-filled stubble. The change is least visible in the garden, where many of the robins and thrushes are still to be seen in their



DUNLIN

old corners, and the wood-pigeon croons on with its old summer note among the shadows swinging wider on the lawn. Garden birds are far more stationary than most of their kindred in the woods and fields; they have shelter and a more constant food-supply, and do not need to roam. But even through the trees of the garden the flights of wandering titmice come flitting in autumn unrest; and sometimes a troop of starlings will sweep over the tree-tops, as if to settle, but rise again and seek the wider fields.

Linnets may sometimes eat the corn spilt among the stubble at harvest-time; but they chiefly visit the cornfields in search of the seeds of cornfield weeds. The presence of these flocks in September and October is one of the most constant and characteristic features of any corn-growing district at this time. They range from small parties of a dozen or twenty to great bodies of several hundreds, or sometimes

even thousands ; and their ways are very fascinating. They are in constant movement from the hedge to the field, or from one part of the field to another, moving with a simultaneous flash of wings, and a jerkier and more erratic flight than the ordinary wheelings and long glissades of the starling flocks. They seem responsive to a hundred thrills of impulse for which we can detect no obvious reason ; but probably it is their fine sense of hearing which gives them so many superfluous alarms, and often prevents them from feeding quietly for more than a few seconds together. We remember watching a large flock of hen chaffinches feeding one winter day in a stubble-field on a high wooded hill above some weirs on the Thames, which were murmuring loud in flood. The noise of the river came beating up through the woods on a gusty breeze, and the birds were continually flying up from the field into the shelter of the surrounding beeches. At last a sudden tremor seized not only the chaffinches on the stubble, but a long-tailed tit searching in a bush close by us ; and a moment later a flaw in the wind brought up the noise of the weir in a deep roar. It seemed that the birds had caught the vibration of the approaching sound before it became audible to human ears ; and most of the sudden movements of birds feeding in flocks are probably due to subtle sounds or cessations of sound, which are unperceived by the human listener, but are perfectly perceptible to their acute and watchful senses.

In the silence of the golden September afternoons in the stubble-fields even our own heavy hearing becomes keener, so that it is easier for us to conceive of the acute senses of birds and wild animals. If the field is empty for a while of wandering flocks, the silence at first seems absolute, when we stand still or lie down on the faintly aromatic haulm. Gradually our ears are opened ; we can hear the far-off

murmur of the threshing-machine—a sound more deeply in harmony with autumn stillness than the throb of the old flail, now seldom heard—or an occasional faint cry from the distant village, or a dog barking at a farm. Then the stillness is invaded by the lilt of a party of linnets, or perhaps the still sweeter call-notes of a flock of goldfinches, as they flit into view in loose order with their springing flight. Goldfinches seldom settle close to the earth among the stubble, as linnets do; while the seeds sought by linnets grow on low weeds, or are strewn on the ground, the goldfinches are hunting for the seeds of thistle and knapweed, and other tall plants, which in stubble-fields are only found by the hedges, or by the side of a raised footpath. The goldfinch is one of the birds which have unmistakably profited by the Wild Birds' Protection Acts; and the beautiful sight of a flock of goldfinches flitting among the autumn thistle-heads is commoner in many parts of the country than it was twenty years ago. But the flocks of linnets make the familiar autumn music in the stubble-fields, combining single notes and brief scraps of their true spring song into a gentle melody that harmonises with the deep sunshine and drowsy fields. In sunny weather linnets spend as much time softly singing in the hedges as in feeding; and sometimes a large flock will burst suddenly forth into a surprising volume of half-articulate song.

Skylarks also begin to haunt the stubble-fields in September in small parties, though the larger flocks come later in the season, and chiefly consist of foreign birds. They now feed on the seeds of cornfield weeds, like the linnets, and are undoubtedly beneficial; the destruction of these troublesome seeds must not be forgotten when they are accused of pulling up the young corn later on. Skylarks occasionally sing all through the autumn on fine days; but

their most familiar note in the stubble-fields is the soft chirrup which they utter as they flit up with their drooping white-edged wings. While skylarks keep to the open field, and linnets haunt both the stubble and the hedgerows, the strings of wandering titmice are to be found in the hedgerows alone. It is a mistaken idea that tits never perch on the ground, but at this time of year their booty is chiefly to be found among the boughs of trees and shrubs, where pupæ of summer insects are numerous, and the kernels of the seeds and berries are ripening. Mixed parties of several species, sometimes accompanied by a goldcrest or two, push from tree to tree through the woods with chirping cries, searching the twigs and crevices in acrobatic attitudes, and constantly pressing on. At the end of a wood they follow the hedge leading down a field; and at the corner of the hedge they jerk across the open space where the larks and linnets are trooping on the stubble, and twitch their way up the hedge on the other side. The great contrast with the ways of the same birds in the nesting-season is that there is no anxious concentration about a certain point—the position of the nest or the young—which was then so conspicuous. The nests that held the young in May are now downbeaten and neglected, or haunted only by nocturnal field-mice; the birds have no care either for them or for the wood that held them, but wander as vaguely as the thistle-down in the autumn air.

In the shortening September evenings the starlings begin to form their great winter congregations. Rooks are gregarious at all seasons of the year; and starlings also nest in colonies on situations such as cliff-faces or old buildings, which provide them with plenty of convenient holes. But from early autumn until the following nesting-season most of them collect to roost in hosts which far outnumber the flocks in

which they feed by day, and form some of the most remarkable spectacles in bird life. The flocks of starlings are usually by far the largest. A little before sunset on September evenings we often see flights of starlings, ranging from several hundreds to parties of ten or a dozen, collecting from all quarters on some small wood or conspicuous group of trees. Every minute fresh flocks fly in, till the trees are black with them, and the lesser boughs nod with their weight; and all the while they utter a chiding murmur which becomes louder and louder as the swarms increase. Suddenly they spring swiftly into the air together with a roar of wings which is sometimes as loud as the early growlings of a thunder-peal, and vanish swiftly towards their roost. They choose for this some dense plantation of rhododendrons or other evergreens, or a close-grown thicket of thorns, or sometimes a large reed or osier bed. The scene at this central meeting-place when the contributory flocks come pouring in from all quarters is almost indescribable. The surge of the incoming armies is almost continuous, but it is half-drowned by the tumult of the birds settling to rest among the boughs. High above the thicket the starlings check their flight, and plunge headlong downward with the wild motion of a broken kite, checking themselves just in time to alight safely in the branches. As twilight deepens the tumult ceases, and the host of birds falls asleep. But it is long before they cease to stir and rumble in the heart of the thicket at any slight alarm; and the least disturbance produces a murmur in the almost solid mass which is extraordinarily impressive in its suggestion of teeming life. The odour of these roosting-places indicates them plainly by day; and evergreen thickets are sometimes stripped half-bare of their leaves by the pressure of the innumerable birds. These roosting-places are abandoned by the great majority of their winter inmates when the flocks

break up for the nesting-season. In most years starlings are paired and distributed in their breeding-places by early April; but after the heavy snowfall at the end of April 1908 huge evening flocks were still to be seen in the first week of May, when all the spring flowers were coming out together in the sudden warmth.

Rooks congregate in their winter roosting-places about the same time in autumn as the starlings, but in much smaller numbers. The dignified passage of seven or eight hundred rooks across the sunset sky has a very different kind of interest from the rallying of the starlings. There is something overwhelming and almost appalling in the starlings' enormous hosts; but the rooks' flocks are large enough to be impressive, without verging so uncomfortably upon infinity. After the end of May, when the young are fully fledged, rooks often desert their rookeries more or less completely, and for the rest of the summer choose other quarters, where they roost in fair-sized flocks. In September or early October they collect for the night in larger bodies in a roost which is often chosen in a large and sheltered wood. Henceforward, until the beginning of the nesting-season, their daily movements have almost the regularity of the sun. Soon after it is light they can be seen passing high overhead to their feeding-grounds on some broad belt of cultivated land; and while the sunset sky is still red, they troop home again on the same steady path. Their movements before settling to roost are often much like those of the starlings, but are less remarkable and defined. They collect with busy clamour in the trees or on the grass not far from the roost, and sometimes plunge to the tree-tops in the same remarkable flight. Starlings roost alone in their great winter congregations; but rooks often forgather with jackdaws and sometimes with smaller and more stationary parties of starlings which

do not frequent the great public dormitories of their kind. It seems not unlikely that the inmates of the great winter starlings' roosts are chiefly or wholly immigrant birds, and that those of our home-bred starlings which remain with us during winter keep to themselves and roost near the places where they build. Though rooks and jackdaws and starlings can often be seen feeding together in the winter fields, starlings do not join the two larger species in their homeward flight. They go early to roost, like sparrows and finches; and by the time that we watch the rooks and jackdaws sailing home through the autumn sky, and listen for the querulous cry of the daw among the rooks' graver voices, they are already snug for the night.



RAGWORT

THE LAST OF THE FLOWERS

THE calm and sunny weather which often fills September seems to add to the richness of summer a new sense of autumn peace. Day after day the golden sunshine lies so deep and still upon the landscape that all strife in Nature seems forgotten, and all change far away. The dews of the longer nights only add new freshness to the lawns and pastures; the glowworms still light their summer lamps in the herbage above the warm dust of the roadside; and the heavier morning mists and the yellow boughs that start out singly in the elm-crowns are such distant warnings of winter that they speak less of decay than of rest. The general colour of the foliage is still the bronzed green of July; and only a slight deepening and tarnishing of the hues of the prevalent flowers mark the change from late summer into early autumn. The white or almost white blossoms which were so conspicuous in spring and early summer have almost vanished. The last of a long succession were the blackberry blossoms in July, which have now turned into the berries ripening from green through crimson to black. Here and there the rank herbage by the watersides still hides straggling plumes of midsummer meadowsweet; but even the meadowsweet is of a soiled whiteness compared with the water

crowfoot and cherry blossom, and many other flowers of spring. Milfoil, or yarrow, still puts up a few heads of white blossom in the pasture-fields and among the roadside grass; but this too, like the white convolvulus stretching from the shadows, is a hardy relic of an earlier epoch, and blooms too rarely to give character to the colour of the time.

In September the dominant hue of the flowers is some shade of purple or lilac; and next to this comes yellow,



HEMP AGRIMONY

which is the most persistent colour at all seasons of the year. But whereas in May the chief colours were yellow and white, so that the yellow buttercups gave the deepest note to the landscape, now the ragwort and hawkweeds and dwarf autumn gorse supply a clearer contrast to the rich tones of lilac and purple. Moors and commons are still flushed with deep purple bell-heather and the paler starry ling. By pools and quieter streams the deep banks of summer

verdure are stained with the mauve plumes of the tall hemp agrimony and lingering masses of purple loosestrife and willowherb. Beneath them and in their fringes the humbler mint-plants lift blossoms of the same prevailing hue. All the streamside blossom that catches the eye readily from a little distance is now of this colour; and it is the same when we pass from the watersides to the commons and upland fields. The autumn or devil's bit scabious blooms in wide stretches of bluish lilac, mingled here and there with ling and heather, or tinged



PURPLE LOOSESTRIFE AND WATER MINT



DEVIL'S BIT SCABIOUS

a little by the faint blue of the harebell. These breadths of scabious blossom are one of the most characteristic features of the September flora; they draw multitudes of early autumn butterflies, and nod with a drowsy murmur beneath the weight of the bumble-bees. The haze that dims the blue of September skies is reflected in the prevailing colour of the flowers beneath. They too have lost the cerulean



HAREBELL

freshness of the spring bluebells and speedwells, and seem dimmed with the age of the year.

Deeper and duller, but still of the same general purplish hue, are the flowers of two species of gentian which bloom in early autumn on chalky hills. The smaller species, usually known as the field gentian, is often very abundant, embroidering the turf of the downs with its short, stiff stems, and heads of blossoms cloven into four points. They are often found half-closed, but expand in bright sunshine. The larger, or autumnal, gentian is a scarcer plant, growing to a foot in height, and easily distinguishable from the largest specimens of the field gentian by the corolla being divided into five

THE GOLDEN VALLEY

By SIR ALFRED EAST, R.A., P.R.B.A.

(By kind permission of the Leeds Corporation)



points instead of four. The common centaury is a kindred plant which is often called the purple gentian, and is also found in September, though it belongs more properly to August. This is more spreading in growth, and has larger



AUTUMN GENTIAN

tufts of smaller lilac-pink blossoms. The corolla is cloven into five segments, like that of the autumnal gentian; but the whole plant is smaller and more branching, and is easily distinguishable, apart from the confusion caused by its popular name. Much like the centaury in general growth and closely

allied to it is the perfoliate yellow-wort, which is often called the yellow gentian. This clings more closely to chalk and limestone soils than the centaury, and is less common. It has bright yellow star-shaped blossoms, and can easily be

recognised by its pairs of smooth grey-green leaves, which surround the stem like a collar. It begins to bloom soon after midsummer but often lingers late into September.



MEADOW SAFFRON

Yet another purple flower, more strictly characteristic of this month, is the beautiful meadow saffron, which thrusts up its head of crocus-like blossom in damp meadows when the verdant aftermath begins to shoot in the autumn dews. It is not very common in this country, and is chiefly seen in some of the valleys of the western Midlands and Wales. In Germany, Switzerland, and some other parts of the Continent it grows abundantly in many of the cooler and shadier grass-

fields, and is familiar to most travellers in late August and September. Much like those of garden crocuses, the leaves shoot after the blossom; but in the case of the saffron they do not appear till the following spring, so that the flowers seem to spring from nothing and vanish almost like soap-

bubbles on the autumn grass. The saffron used to colour cakes and other dishes is procured from the long stigmas, which droop over the edge of the blossom when it opens wide to the September sun. Unfortunately this beautiful plant is poisonous to cattle, and is a dangerous weed in pastures where it grows abundantly.

The lady's tresses orchid is as characteristically fond of the short turf of dry pastures and limestone hills as the meadow saffron of damp and grassy hollows. It is a true autumn-blooming plant, seldom opening until well into September, and sometimes lasting into October. All our British orchises have a share of the curious and fascinating qualities which reach their height in many of the tropical species and their hothouse varieties; and although the lady's tresses is a humble and inconspicuous little plant at first sight, it has plenty of attraction. It has a slender stem about five inches high, the upper part of which bears a succession of small dull white blossoms running spirally up to the point. This spiral arrangement gives a plaited appearance to the spike, and so suggests the plant's English name. Besides this neat and delicate growth, the flowers have a scent at evening as sweet and as powerful in proportion to their size as the butterfly orchis of the June beech-woods or the fragrant orchis of the hayfields. The blossoms are so small that they arrest the eye by their pattern rather than their colour; and the plant grows so sparsely and slenderly among the dry bent grasses that it hardly makes an exception to the general absence of white in the autumn flora. A more marked exception to the prevailing colour of the time is afforded by the blue autumn squill. There are two kinds of squill, one blooming in autumn and one in spring. Both are very abundant in their chosen haunts on the turf of sea-cliffs; but the blue of the autumn species is almost as pure

and springlike as that of its forerunner in May. Yet even in this case there is a tinge of purple in the autumn blossom; and while the sheets of vernal squill that cloak the turf on many Cornish cliff-tops seem to reflect the sky, the colour of the autumnal squill seems to be borrowed from the bands of bluish purple in the September sea. For the sea's colour also changes with the seasons on those coasts; and by the end of the summer it is streaked and belted with rich greens and purples that are absent from the colder waters in spring.

Many seaside and inland cliffs, as well as most heaths and commons where the spring gorse flames in May, are lit up by the fires of the dwarf species in early autumn. The dwarf gorse or furze is not to be confused with the needle furze, or petty whin; the latter is a spare and almost creeping plant with fine, needlelike thorns and small yellow pea-like blossoms, which flowers in early summer on bare heathy commons. Dwarf furze generally grows about three feet high, and is apt to be mistaken for the common species; but it is not difficult to distinguish by its much lower stature and its habit of coming into full bloom from late August to October. It is less woody and branched, its growth inclining more to short sprays springing direct from the root, or to a dense cushionlike bush, when clipped by rabbits or the wind. Its stems and needles are distinctly yellowish-green, so that the boughs of common gorse seem almost blue-black or inky beside them; and the blossom is of a perceptibly deeper shade of yellow. This is another case in which an autumn flower is deeper in colour than its spring equivalent. Though the heather is gradually fading as the dwarf furze is coming into full bloom, their mingled purple and gold clothe the hills with a splendid garment under the September sun. In the cool grass of mountain ledges and upland mires,

September still nurses the white blossoms of the grass of Parnassus, as delicate as any flower of the lowland spring. Its green-veined petals, happiest when holding a bead of dew, have a freshness that is gone at this season from the stream-sides where it would mingle so well with the April cuckoo-flowers. Often not far away, the white tufts of the cotton-grass waver in the moorland or mountain wind.

In cultivated lowland districts one of the chief interests in the plant life of September is the discovery of the numerous cornfield weeds which the tall corn has hitherto concealed. Among thick crops their growth is often delayed for want of light and sunshine, so that when the corn is carried there is a tardy flower-time among many pleasant weeds. Venus's comb, or shepherd's needle, ripens its pointed seed-vessels, or still opens its small white umbels of blossoms like dwarf cow parsley.

Fluellen trails among the stubble its angular leaves and mouthlike blossoms, with one lip dark purple-brown and the other yellow; and here and there round-leaved toad flax creeps with the same curious blossoms, but with leaves not sharp at the base. The narrow-leaved hemp nettle is an abundant weed in autumn in cornfields on a chalk soil;



TOAD FLAX

it has a purple labiate blossom, mottled with creamy white or pale yellow, and grows from three to six inches high. A larger and more conspicuous member of the tribe is the large flowered hemp-nettle, with purple-spotted yellow flowers like those of the red and white dead-nettles which are common on hedgebanks and in gardens. It is common in cultivated fields in mountainous districts. The tall yellow toad flax, or 'butter and eggs,' is a late summer flower which blooms on strongly into September;



MUSK MALLOW

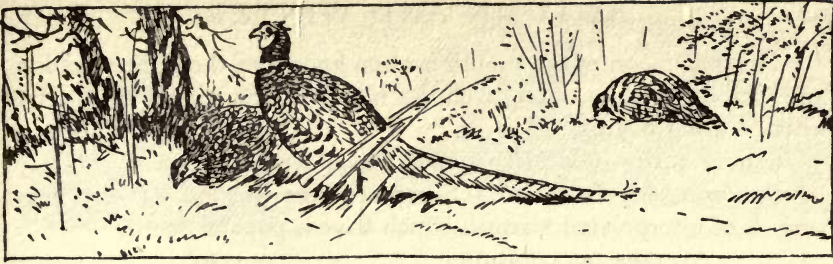
and in some counties the fringes of the roads and cornfields are brightened here and there with the large rosy blossoms of the musk mallow, which flowers persistently from May to September, or even October. These two plants do not grow among the corn, but at its side; but on soils free from chalk or limestone the golden corn marigold often blossoms vigorously after the crop is carried. It often puts forth an extraordinarily vigorous autumn growth on cultivated land when the summer has either been exceptionally dry or exceptionally wet. In the former case, after lying parched and dormant through drought, it is stirred to new vigour by

the autumn rain; while a very wet summer produces a luxuriant growth of stems, which then make haste to blossom in the autumn sunshine. The same autumnal vigour is shown in either set of circumstances by corn-poppies and the scent-



SUCCORY

less mayweed, as well as by succory and other less profuse and conspicuous blossoms of tilled land. In normally equable seasons their flowering-time is almost over before September begins; but great drought or continued rains in summer will set them gaily blooming by the autumn sheepfolds.



OCTOBER

'The day becomes more solemn and serene
When noon is ended : there is a harmony
In autumn, a lustre in its sky,
Which through the summer is not heard and seen,
As if it could not be, as if it had not been.'

SHELLEY, *Hymn to Intellectual Beauty*.

THE COUNTRY CALENDAR

IN October, the 'battle month' of the red deer, we take a last leave of summer. The mark of the weather is the coming of frost in the morning and evening, and the heavy morning mists. Such frosts will often fell every leaf of chestnut and ash within the day. It is seldom that either of these heavy-leaved trees keep more than a few leaves beyond the end of the month. The same frosts kill or send into hiding the last of the insects. But the middle of the day, especially about the date of St. Luke's Summer, is often warm and soft. Towards the end of the month easterly winds are apt to return. A few flowers remain—the miniature gorse, the meadow crocus, corn wound-wort, horehound, wood sage, wild mint, and ivy. As the flowers disappear the fungi multiply. Search is now made for truffles in the beech-woods. There is a rhyme quoted in Mr. Steward's *Nature-study Notebook* :

'A good October, and a good blast
To blow the hog acorn and mast.'

It is a popular saying—'Much rain in October, much wind in December.'

October 1st.—The close season for pheasants, which are the last of the young birds to reach maturity, comes to an end, and shooting is legal.

The first moon of the month is often known as the hunter's moon ; and October 15th is often given, for no particular reason, as the date when hunting begins.

October 12th.—Old Michaelmas Day.

October 18th.—St. Luke's Summer ; the second of the short periods of interpolated warmth which have a popular name.

Average temperature, 50°.

Average rainfall, 2·81 inches.

On October 1st, sun rises 6.2 a.m. and sets 5.41 p.m.



THE BURNING BUSH

MAPLES, 'burning themselves away,' provide in Canada almost a national festival, as well as a national emblem. The cherry blossom, æsthetically if not mystically worshipped in Japan, does not excel the cult of the burning leaf in North America. This Canadian red maple, in which the broad ample leaf is suffused over its whole surface by an even crimson of the richest tint, is not found in England. The common English maple of the hedgerows often turns a level yellow; and even in the redder form is excelled in colours by a dozen other leaves, by cherry and beech and spindle and briar. We have indeed nothing to compare with the red maple. Its startling pillars of flame and hot fires from the burning bush make the supreme glory of autumn colour. In places where a red maple is isolated from other maples, especially if it is seen against fir-trees, the optical effect is as though a hole had been made in the background, a sort of irregular casement cut in the wood, through which a strange light shone. You seem to see far away through a cleft at the back of which some glowing metal is heated red. The impression, which is vivid and curious, is not an idiosyncrasy. Very many people have felt this illusion in looking at the red and rayless sun through the copper-coloured mist. Others have had it in most persuasive form looking at the few first flowers of a red may. The tree perhaps had been pruned, and bears in

consequence few flowers set deep behind the billowy green. They might be the peep-holes of a furnace, and at a distance it will be quite hard not to feel that you see a red light glowing from somewhere on the far side of the tree.

Many countries outflame England in the autumn. Above the Danube rise banks of wood so over-gorgeous as to seem upholstered in gorgeous and fantastic colour. The Philistine who compared them with a Turkey carpet had full excuse. We achieve the effect in some of our English gardens. Banks of acer or maple in every tint are in fashion. The sumach, which outdoes the maple in riot of colour, is a popular exotic. But the crowning colour in rough gardens, which in many places now disappear into the rougher grounds about them, is the berberis in several varieties. There is a famous Westmorland rough garden, compounded as part of a wood rising abruptly from the river, which in its measure outdoes the Canadian autumn. The river Lune at that point cuts through some strata of very red red sandstone, which shows its boulders here and there in the wood and garden. Almost in the centre, as it happens, of the garden grows luxuriantly the reddest of all the varieties of berberis. It looks as if it had sucked its colour from the stone and from the sunset. You might think that it would light up the garden when dusk falls. But our gardens, and the Canadian and Danubian woods, excel our countryside more in glory than in grace.

The continental transformation scene is well described by Kerner, that great and most lively of European botanists. 'The first frosts are the signal for the beginning of the vintage; all is busy in the vine-planted districts, and the call of the vine-dresser resounds from hill to hill. But it is also the signal for the forests on the mountain slopes, and in the meadows, to change their hues. What an abundance

of colour is then unfolded ; the crowns of the pines, bluish-green ; the slender summits of the firs, dark green ; the foliage of hornbeams, maples, and white-stemmed birches, pale yellow ; the oaks, brownish-yellow ; the broad tracks of forest stocked with beeches in all gradations, from yellowish to brownish-red ; the mountain ashes, cherries and barberry bushes, scarlet ; the bird-cherry and wild service trees, purple ; the cornel and spindle-tree, violet ; aspens, orange ; abeles and silver willows, white and grey ; and alders a dull brownish-green. And all these colours are distributed in the most varied and charming manner. Here are dark patches traversed by broad light bands and narrow twisted stripes ; there the forest is symmetrically patterned : there again the Chinese fire of an isolated cherry-tree, or the summit of a single birch, with its lustrous gold springing up among the pines, illuminates the green background. To be sure, this splendour of colours lasts but a short time. At the end of October the first frosts set in, and when the north wind rages over the mountain tops, all the red, violet, yellow and brown foliage is shaken from the branches, tossed in a gay whirl to the ground, and drifted together along the hedges. After a few days the mantle of foliage on the ground takes on a uniform brown tint, and in a few more days is buried under the winter coat of snow.'

The colours are even more splendid in Canada, and the variety is greater. In a good year the duration is much longer. The tree of trees, as it seems to many English visitors in Canada, and now indeed in South Africa, is the oak. The varieties are very numerous. Some have almost smooth leaves which change, as the green departs, into blades of a tawny red, more like the deep colour of an amaryllis than any leaf. In addition to the rhus and tulip-tree and sumach, and many others not less gorgeous, such

creepers as we term Virginian will wrap trunk and boughs to the very summit in parasitic flames. In our gardens we may claim some of the great and glorious splendour. The lovely liquid-amber flourishes in England. We may grow the creepers about our trees. Already here and there several of the finest Canadian oaks have grown to great sizes even in the English fields. The tulip-tree is the glory of New



THE TULIP-TREE

College garden, Oxford, the Judas-tree of old Dulwich, the flowering Tree of Heaven of Battersea Park, and a hundred sorts of flowering exotics of Kew.

But in spite of all the autumnal wonder round Lake Erie, it is not easy to find a superior to the English hedge-row in autumn or the long-drawn turning of the trees. Nature, one may say, is so natural in England. Yet here, too, the splendour of

autumn is sudden beyond other changes and so prompts inquiry into the inner causes of this yearly explosion of colour coming strangely when summer dies, and we might expect from nature a drab and melancholy scene.

The clear yellow which gives the waning elms a sunlit appearance, as if some partial shaft had caught this and that bough, is not only different in quality of colour, but also in causation, from the reds and purples that run in streaks down the leaves of the spindle-tree or the jolly red of the cherry. Among the chemical properties with which a plant is endowed is a store of colouring matter which may dis-

AUTUMN WOOD

By SIR ALFRED EAST, R.A., P.R.B.A.



appear, and grows red or blue, or what not colour, according to the acids with which it comes in contact. This colouring matter plays a part which is little understood. But some of its functions are known. It has beyond doubt a protective purpose. A walnut-tree in spring has almost an



FLOWERS OF TULIP-TREE

autumnal appearance, so red are the young leaves. This same ruddy tint invades the young rose leaves and those of many another tree. The colour in this case protects the tender green from excessive burning from the sun and screens the chlorophyll which is the tree's life-blood. This colouring is best seen on the skin of apples and other fruits. It will make its appearance even on pure white roots if they are exposed to the sun. It is present in varying force in

different plants. The kexes are full of it. You see it in the purple spots, which give so poisonous a look to the stems of the hemlock. It appears more beautifully in the leaves of the common kexes, chervil or cow's parsley, on which odd leaves capriciously assume a hue of gorgeous purple.

These reds and purples, probably always present as matter within the leaves, become vivid as soon as the green chlorophyll is gone. Autumn colouring is indeed the outward sign of a migration, or one might say a hibernation, which has more than a fanciful parallel with autumn habits in the animal kingdom. Waste is not Nature's way, except where reproduction is concerned. When the leaves, those slight but perfectly designed factories for the manufacture of carbon and chlorophyll, have done their part, the stuff is all transferred to the solid and permanent members of the tree. A 'migration'—botanists use the word—begins, and by the same paths that the sap flowed up the chlorophyll flows back. When it has left the leaf the colours previously hid appear. With the eyes or with the microscope this may best be seen on the spindle leaf from which the green flows back by partial streams, leaving curious streaks and layers. One part of the leaf will be deep green, another purple, another almost a brick red. The quick contrast of green and red makes very gorgeous the floor of the Alps when autumn comes, when the bearberry and a host of other ground plants give the slope quite as gorgeous a carpet as the spring flowers themselves. The ground is not less gorgeous in Newfoundland, and the leaves of the wild currant, which combine as many tints, though not in quite such abrupt contrast, as the spindle-tree itself. When this is complete in the elm the leaves are left pure yellow. But this colour is not due to any definite matter provided among

the attributes of the tree. It is due, principally if not wholly, to the crystals of the waste substances left when all that is useful to the economy of the tree is withdrawn, has migrated, has retired to winter quarters. But even this refuse leaf has still its purpose to fill.

The elm leaves, as indeed most others, are full of lime in one form or another ; and though this is of no use to the new buds that are to form for the coming spring, and is there-



HORSE-CHESTNUT

fore rejected, it is most useful to the soil, and will serve later to feed the roots ; and so the circle will be complete. In our kindly country, autumn may last for many months. We may see the elms still green in the last week of November ; and the elms, those pillars of English scenery, are much the hardiest of all the more aspiring growths. From a record of nature-study dates kept over many years it appears that the fleshy and wide-leaved trees succumb for the most part soon after the first week of October. A frost and a misty morning, followed by a clearing sun, will send every horse-chestnut leaf to the ground. They will

tumble in a continuous downpour from noon to eve, till they are heaped high over the gleaming fruit. The children come and paddle gaily in the litter as if it were a sandy pool and the chestnuts shrimps. The horse-chestnut for the most part makes a good show of colour before the frost comes. It had made preparation to lose its leaves, as any one may tell who looks at the bare twig or the leaf. Between the leaf and twig have formed little studs of cork in a pattern always perfect to type. The scar remains on the twigs, pencilling them with a quaint crescent for the rest of the year.

A worse sufferer from October frosts is the ash. The tree is the last to come into leaf. Tennyson's 'more black than ashbuds in the front of March' has bruited one fact as widely as any little piece of botanical knowledge. He might also have written: More black than ash leaves in October frost. While still full of juice and green with energy, they are cut in one night to as black a tint as the tops of our early potatoes, and fall down in a lugubrious, a most vicious circle about the tree. One wonders that the tree recovers; and it may be that the loss of vigour tends to the late production of leaf in the spring.

The reddest tree in the English scenery is the cherry, which is frequent in Hertfordshire and many Midland counties. Its pillar of flame stands out as distinctly in the autumn as its bridal figure in the spring. Its nearest parallel in what some Midland writer called remoter England, is the mountain ash, which brings the very hues of sunset into many a Welsh landscape.

But the glory of the English autumn is not red, but what we call brown. If any one were asked to recall a characteristic English scene from October, his mind would first recur to the beech-woods. One must perhaps call the leaves

brown ; and yet they seem the very contradiction of brown leaves, to the brown leaves, for example, of the hornbeam, which is very like the beech both in foliage and nature. The beech is vivid and luminous, akin to the brilliant bands of the spectrum. The hornbeam is dull and gloomy beyond almost any leaf, unless it be the mildewed white poplar. How strangely vivid the massed beech leaf is was curiously illustrated one day by a party astray in a very open beech-wood. They saw a cock pheasant running in front, and as the wood was full of pheasants, no one looked at him with any special attention ; but it was noticed by some one that the bird had vanished in rather surprising fashion. He walked towards the vanishing point, but could at first see nothing. At last, within three or four yards of where he stood, he made out with difficulty the rainbow hues of the vanished bird. There is no English bird which can compare with the Chinese pheasant in range of hue ; but the beech leaves almost outshine him. He was at least matched by the layer of leaves ; and if any Darwinian had the courage to claim the example, his vanishing trick could be quoted as an illustration of protective coloration.

The beech saves many a landscape from autumn gloom. Bracken alone plays as large a part. An isolated bracken may look as dead as the withered stalks of the grasses or the nettles, or the brittle kexes—hogweed and cow's parsley and the rest—or the burdock stems. All these are cenotaphs, unlovely places marking the extinction of sweet life, and in spite of red dogwood and tawny blackberry and painted spindle, giving a spent and wasted look to some autumn hedgerows. But bracken, at its best, is the crowning colour of many a scene that would be bare and bleak without. It is best where the ground is most barren. It clothes the hills all over the lake country of Westmorland and Cumberland

with sunny patches of light varying from pale yellow to deep brown. It is the one cheerful thing on some Norfolk wastes; and even in its duller and browner form, is the chief autumn and indeed winter beauty of many English woods else gloomy enough in the season of fallen leaves. Lake enthusiasts protest that they rejoice in the absence of heather



THE YOUNG SHOOTS OF THE BRACKEN ENTANGLED AMONG THE DEAD STALKS

from the hills, preferring the yellow patches of fern to all the dusky browns of withered ling.

It is the glory of bracken that it lives beyond autumn into spring, until at last its dried stalks begin to look strangely out of place among the encircling fingers of the new shoots. It is not alone. The blackberry briar, as Darwin noticed, is on the way to become an evergreen. In the woodland, many sprays will be as freshly green as the hollies in December; and when in spring the young shoots

are growing lusty, they have much ado to thrust off the older leaves which even yet are not wholly browned. Like them, too, oak and beech and hornbeam, especially in the coppiced form, are 'fast of their leaves' through winter; and this quality gives especial virtue to a hornbeam hedge, which perhaps is the 'fastest' of the trio, though we miss the luminous richness of the beech.

Any one who has been to Australia, or any land where all the trees are evergreen, will feel how much of the zest of English scenery comes from the deciduous trees. Painters of autumn colouring delight in the contrast of the firs and pines; but there is contrast enough in the changing leaves. The colours are best of all on the hedgerows, where no evergreen is. Thankfulness for this gift of colour in the final scene of the pageant is prompted by the real melancholy of much that grows at the hedgerow foot. There is nothing more lifeless than the withered bents of grass, than the shrivelled strands of the goosegrass, than the hollow parsley which in spring made a green bed for the hedge. They suggest all the gloom which is the professional attribute of autumn. But above them, rich in the deepest of all autumn colours, the May bush rises; berries, stems and leaves, all of a royal colour which we would scarcely exchange for the freshness of spring itself.



YOUNG CUCKOO RESTING ON ITS JOURNEY SOUTH

THE SOUTHWARD FLIGHT

THE departure of the summer birds first becomes conspicuous in October, though it has been in progress ever since the flight of the parent cuckoos in July. Most of the summer migrants live so silent and elusive a life after the young are hatched that it is difficult to trace their movements; and when some bird has been familiar to eye or ear for many weeks, we are apt to overlook its departure, and only later to realise that it has been missing for an indefinite time. Old cuckoos are able to slip away so early because they avoid bringing up their young; but the young cuckoos do not go until late August or September, and thus receive no guidance from their parents on the journey. The exact processes of migration are still so imperfectly understood that we cannot tell whether the young cuckoos are guided to their winter homes in Central and Southern Africa by transmitted habit or 'instinct,' by the direct influence of the changing weather in more northern climes, or by following other migrants. Next to the parent cuckoos, the first birds to leave the country are the swifts. Their usual time of departure is the second week in August; but it is not very uncommon to see one or two stragglers as late as the beginning of September. The swift is one of the latest birds to come, as well as the earliest to go; a bare three

months is its whole sojourn in this country. It seems probable that its early departure is due to the diminishing supply of insects at the lofty levels where it prefers to feed. By the beginning of August the nights are already growing far longer and more dewy than they were in June; and the period when Britain is habitable for the swift seems to lie within six or seven weeks on either side of Midsummer Day.

As September goes by, we gradually miss several birds from their accustomed haunts, if we keep a careful daily watch.

Some warm day in the garden we notice that the spotted fly-catcher is no longer perched in its favourite position on the tennis-post or the corner of the porch; and in the evening twilight we miss the nightjar flitting noise-



NIGHTJAR

lessly down the clearing in the copse. Both these birds are late-comers, and obey the same general rule as the swift in being quick to go. For them too, with their need for an abundant insect diet, the English climate sets an early term of departure. But still we can hardly feel that the summer birds are really leaving us, so long as the days are full of sunshine, and the empty places are so few as compared with any week in the quiet time since June.

By October there is no mistaking that the southward migration is in full swing. It is most visible in the case of the swallows and their kindred, which migrate by day. The concourses of swallows and martins on roofs and telegraph wires are not only larger than when they first began in

September, but much more restless and shifting. If we keep close watch, we shall find that sooner or later, when some party rises and circles in the air, it does not come back to the perch as it did after its former sallies, but vanishes in the southern sky. An hour or two later, the church spire or barn roof may be once more thick with swallows or martins; but they are a new contingent. The same quiet coming and going of smaller parties may be seen on an October day over sheltered pools and rivers, or warm meadows in the lee of a wood. The swallows sweep so regularly over the water or past the boughs that they look like the regular summer residents; yet, ten minutes later, they may be gone, leaving the surface of the pool spread empty between its orange sedges. This quiet but constant stream of travel is even more impressive than the great simultaneous movements of the larger flocks. It suggests far more vividly the elusive secrecy of the movement which has been depeopling our copses and gardens for weeks past, till we awake to find them almost desolate, or occupied by restless strangers. For sheer impressiveness of numbers, the first place is easily taken by the collection of a large flock of migrating swallows in a roost in some reed or osier bed. They plunge downwards almost as wildly as roosting starlings; and it was the sight of the swallows plunging so quickly towards the water on some autumn evening about the time when they were seen no more which most helped to foster the belief that they slept out the winter at the bottom of the rivers and ponds. They also roost in crevices about the buildings which they haunt by day.

The distance travelled by migrating birds in autumn varies enormously with different species. Marked storks from Denmark, Germany, and Hungary have been identified in the winter months in Syria and various parts of Central

and South Africa ; while a still greater distance is travelled by several species of waders which breed in the far north of the Russian Empire or in Greenland, and winter as far south as Cape Colony. Some of these birds, such as the little stint and curlew-sandpiper, occur in Britain only as passengers for some weeks in spring and autumn, on their way between their southern and northern homes. Other species, such as the knot and sanderling, are also winter visitors. Most of them haunt the sea coasts, especially the oozy estuaries, which supply them with the most extensive feeding-grounds. But a typical bird of double passage, often seen along inland streams in spring and early autumn, is the green sandpiper. It can be easily distinguished from the common sandpiper with a fieldglass, or even with the naked eye, by the tail being transversely barred with white, instead of being merely edged with it. The green sandpiper nests in the Baltic and Arctic basins, and winters in Africa and southern Europe.

As birds which cross the equator on either passage secure two summers in each year, and no winter, there seems no reason why our birds should not breed twice a year, once in either hemisphere. But all the most trustworthy evidence at present indicates that they nest only in the northern hemisphere ; no certain case has yet been reported of any bird which nests in summer in the far north of Europe or America also nesting in South Africa or South America. Some of these birds of double passage are believed to travel as much as eleven thousand miles in each direction annually. From these vast journeys the scale of distances traversed on migration descends to the few yards which part the nesting-quarters of a robin or pied wagtail in the shrubbery or by the farmyard pond from its winter haunts in the sheltered

part of the garden or by the back door. One great route of migration in autumn runs from the west of England through southern Ireland or north-western France, and thence to the sunny coastal districts of Spain and Portugal, where many birds from northern Europe find a winter home. Two plovers marked in the nest near Stirling have been found in Portugal, and five others in Ireland; a song-thrush from Aberdeen and a black-headed gull from Argyllshire were also found in Portugal. But in spite of these and other instances showing the importance of this route, other birds of the same kinds have been found in winter not many miles from their nesting-quarters. In the case of many of the hardier birds, the migratory movement is plainly very irregular, and may be regarded as almost optional. Sometimes they are even found migrating the wrong way, that is, towards the colder quarter. A song-thrush marked in Berkshire in April was found in November near Norwich—having migrated in exactly the opposite direction to thousands of thrushes, and larks, and plovers, and rooks, and many other kinds of birds which come over from Germany to England at that time. Even more striking was the eastward journey of a starling marked in Berkshire in February, which was found in Kent before the end of the month. Because the east of Europe is colder in winter than the west, the usual line of autumn and winter migration is south-westerly, and sometimes even north-westerly, and not, as might be thought, direct from north to south.

To a considerable extent—exactly how much we cannot yet tell—migrating birds follow definite routes, such as a river valley like that of the Thames as it leads northwards past Oxford, or the line of the seashore. The rarity of certain birds of double passage in spring as compared with autumn, or vice versa, indicates that they do not all follow

the same route on both journeys. At least one striking case has been discovered in which the spring and autumn tracks lie far apart. The American golden plover flies straight across the sea in autumn from Nova Scotia to the coast of South America—a distance of about 2,500 miles; but it returns in spring by a more circuitous route to westwards, through Mexico and up the Mississippi valley.

There seems to be an obvious reason in the failure of the food-supply why birds of passage should depart southward in autumn to milder climes. But it is not so easy to understand why they should want to return in spring. It might be thought that they would be well enough off where they were, like the resident species of tropical forests, without daring the long journey over land and sea to reach some distant corner of the British islands, or some haunt even further to northwards, within the Arctic circle. The key to this movement is probably to be found in their general habit of scattering in pairs in spring, to bring up their young in privacy and with an ampler food-supply than they need when there are only their own mouths to fill. They would thus naturally tend to spread outwards from their winter home; and those birds would thrive best which pressed further and further to northwards (or to the south, in the southern hemisphere), and so gained the advantage of longer daylight and a longer period each day in which they could hunt for food. As they settled in a new home, inherited habit would tend to attach them to it by a strong bond; and so the great double migration would grow up, at the times of year when the seasons most sharply change. Marvellous as the length and adventurousness of their passage seems, it has after all to be remembered that birds are winged creatures, constructed by nature with supreme powers of locomotion; and that they do sometimes perish

on migration in great numbers. But the waste of life from storm on passage or untimely and exceptional cold on arrival is probably more than made up by the advantage of rearing their broods in the most favourable circumstances.

Just as all existing species of birds are the result of a continuous chain of evolution, of which many of the connecting links have not been preserved, so the great movements of the migrants between their summer and winter homes are probably the outcome of a gradual and tentative process of migration, which has been fixed on its present lines by the survival of the fittest. Most birds live in flocks for the greater part of the year, only separating for the comparatively short nesting-season; so that gregariousness seems their natural and earliest habit. As they broke up for the breeding-season, and at first spread evenly outwards from their gregarious haunts, they would come sharply into competition with other birds expanding outwards in the same way. Gradually the struggle for life would settle which group of species was the strongest in each region; those species which were best adapted to its peculiar conditions would prevail, and those which were less well adapted would tend to die out within this area, but would have a better chance to the north, where fresh lands lay open each spring. Their migrations would further tend to be controlled by their power to endure the winter climate of their new homes. If they could pick up a living there in winter as well as in summer, they became resident species; if not, they became what we call summer migrants. Winter visitors—a term which is used more often than winter migrants, but precisely corresponds to it—are the summer migrants of more northern regions, viewed from the winter end of their journey. Such are the redwings and fieldfares, which usually arrive with us in November; these are summer visitors to Norway and

Sweden, like the nightingale or swallow in England. Our birds of double passage, like the green sandpiper, are summer and winter migrants in other parts of the world. The woodcock in Great Britain is chiefly a winter visitor, but to a small (though increasing) extent a resident species. In Austria it is a bird of double passage, though much commoner in autumn than in spring. In central Germany the robin is chiefly a summer migrant, and only occasionally a resident. Such examples show how hard it is to get a true understanding of the habits of birds if we only consider their habits in our own islands, from our local point of view. We should always think of them as essentially migratory creatures; though there are more or less definite exceptions. The Dartford warbler and the Cornish chough are among the more resident British species; and their scarcity and very local distribution show how unprofitable it often is for a species to become too much wedded to one locality. The case of the extinct great auk is another famous instance in point. Even such common resident species as thrushes and robins would fare ill if the majority of their individual members were really resident. Probably not one in fifty of the song-thrushes which breed in England find safe winter quarters within a mile of their nesting-place; and the rest are migrants. Often on an October morning we may see the lawn harbour, for a short rest, one or two yellow wagtails, or a larger party of pied wagtails, running with equal grace and activity over the dewy grass. According to the traditional distinction framed from a local British standpoint, the yellow wagtail is a summer migrant, and the pied one a resident. But most pied wagtails migrate, and both the pied and the yellow that alight on the lawn in this way are migrants on autumn passage from England.



PRIVET-BERRIES

FRUITFUL HEDGEROWS

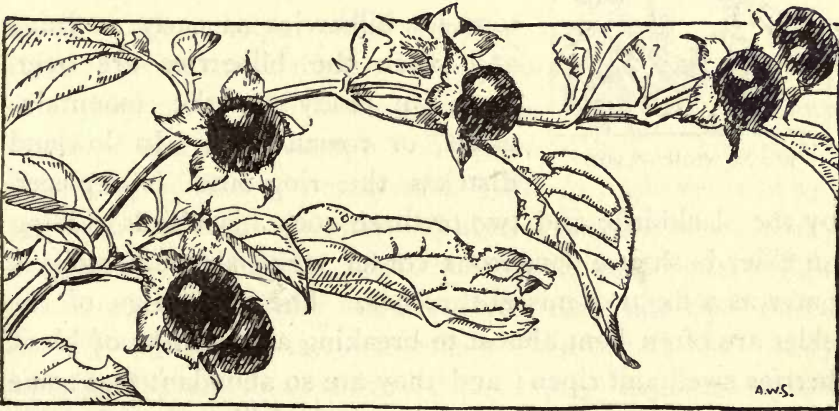
RIPENING berries in October brighten innumerable hedgerows with a more fruitful splendour than the colours of the changing leaves. In warm September weather, the monotony of the bronzed foliage and unripe berries is merged by the hazy sunshine into uniform peace; but when the beginning of autumn is marked, as sometimes happens, by sharp winds and unrefreshing showers, there is a singular lack of interest in the landscape of faded summer colours without summer warmth. All Nature seems chilled and inert, and waiting for a new inspiration. It comes when the woods and hedgerows break into a hundred contrasting hues under the October rains and frosts. Amid the broader splashes of colour formed by the changing leaves, the ripening berries gleam with a concentrated intensity that appeals both to the eye and the mind. The crimson berries hanging among the orange boughs of the hawthorn are the sustenance of birds and animals in their time of dearth, and the seed of plants which will flourish in distant places. The promise of the spring and summer flowers is brought to visible fulfilment in the crop of autumn berries; and when it is brilliant and abundant, it sets a crown of prosperity on the wild year.

The softer and juicier berries form a dainty which is gluttonously devoured very early in the season. At the



WOODY NIGHTSHADE

beginning of October the wandering missel-thrushes are already stripping the heavy scarlet clusters of the mountain-ash on the open hillsides, and raiding the trees in gardens



DEADLY NIGHTSHADE

with noisy oscillations of attack and flight. The missel-thrushes are wise to be so greedy; for the overweighted

clusters of soft berries soon break and decay under October winds and frost. They are all stripped, as a rule, before the leaves of their trees have changed from green to amber and orange. Equally juicy and attractive are the translucent scarlet clusters that make such an exquisite contrast with the deep crimson leaves of the wild guelder-rose, which is the original stock of the round-blossomed 'box-rose' of gardens.

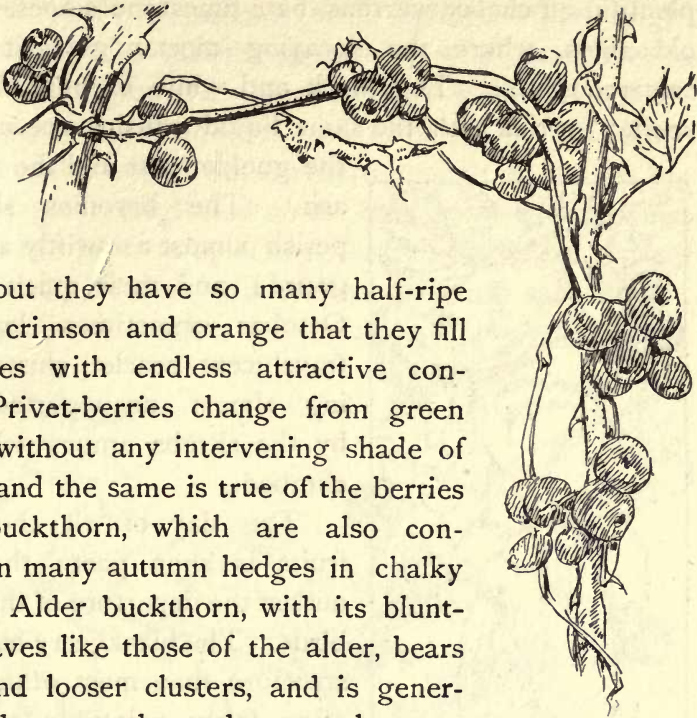


BLACK NIGHTSHADE

The clusters of the mealy guelder, or wayfaring-tree, are stiffer in growth, and turn from scarlet to black as they ripen. All these softer berries, including those of the elder and the bilberries of August moorlands, are specially attractive to the same fruit-eating birds which raid strawberry and gooseberry beds earlier in the season. Flocks of ring-ousels and missel-thrushes begin to roam the Westmorland mountaintops for bilberries as early as July; and when the bilberries are over, they are ready for the mountain-ashes, or rowan-trees. In lowland districts the ring-ousel is replaced

by the blackbird; and two or three cock blackbirds raiding an elder-bush at a dangerous corner make almost as noisy a party as a flight of missel-thrushes. The soft twigs of the elder are often bent almost to breaking as the disks of black berries swell and ripen; and they are so abundant that some are still usually left when the early-falling leaves have burned themselves out in their tints of flame, and the ground beneath is strewn with their pallid drift.

Black and scarlet are the chief tints of ripe autumn



BLACK BRYONY

berries ; but they have so many half-ripe shades of crimson and orange that they fill the hedges with endless attractive contrasts. Privet-berries change from green to black without any intervening shade of crimson ; and the same is true of the berries of the buckthorn, which are also conspicuous in many autumn hedges in chalky districts. Alder buckthorn, with its blunt-tipped leaves like those of the alder, bears smaller and looser clusters, and is generally found on sandy and not calcareous soils. But unripe elder-berries have almost as many shades of crimson as blackberries ; and they all make a characteristic contrast with any shade of scarlet or orange. The gradations of colour are essentially different in each case. Woody nightshade hangs small but abundant clusters of scarlet berries about many hedgerows and thickets, often opening its purple and yellow blossoms on the same stem as ripe and half-ripe fruits. Deadly nightshade never becomes a climber as the woody nightshade does when it can ; it is a bushy herbaceous plant about a yard high, and its very poisonous berries are like black cherries. They ripen in August, but the plant does not die down till the middle or end of October. It is much rarer than the woody nightshade, but is sometimes

plentiful on chalky warrens, bare limestone slopes, or among old ruins, where the decaying mortar gives it a similar calcareous soil. The black and white bryonies both bear scarlet berries with the same liquid translucence as those of



WHITE BRYONY

the guelder-rose and the mountain-ash. The bryonies shoot and perish almost as swiftly as Jonah's gourd; and their quick decay in October sometimes leaves the translucent scarlet clusters hanging almost unsupported, except by the shrubs among which they climbed.

The day of all these softer fruits is soon past; they barely outlast the departure of the summer birds. The blackberry has a firmer structure than most others, and is often fairly palatable as late as mid-November. It is curious that blackberries are very much less attractive to birds than to man; blackbirds and thrushes seem seldom to touch them, except in very dry seasons, when they are thankful for any food which helps to quench their thirst. This difference of taste is all the more marked as both birds and men like wild raspberries, which would seem to us berries of much the same class as blackberries, and very different from those of the guelder or rowan. But even the blackberry is a perishable food compared with many of the seeds and berries which provide a food-supply to many birds

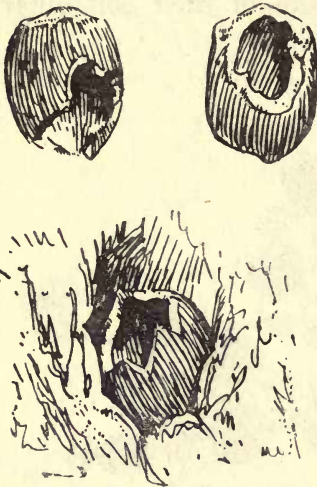
and several kinds of animals until spring. The bright scarlet tints of the various species of wild rose have a tough rind that preserves them for many weeks or months, if they escape the bullfinches and wood-mice. Hawthorn berries are rather softer, but are hard enough to outlast the winter, and gleam neglected on the boughs of spring, when the winter has been an open one, and the birds are turning to other fare. Yewberries are often devoured early in the autumn by missel-thrushes for the sake of their soft outer



BLACKBERRY

pulp; but after the pulp has decayed, the hard inner seed is searched out all through the winter by the great tit, like the stones of whitebeam-berries and of haws. Thus the same fruit may be sought by some species for its pulp, and by another for the enclosed kernels. Blackbirds devour the softer rose-haws for the red pulp; but bullfinches and tits seem to open them for the sake of the numerous little kernels enclosed in a hairy core. Redwings and thrushes swallow haws for the sake of the pulp; but tits crack the stone, and wood-mice pierce it for the sake of the kernel. Many kinds of seeds and small stones can be found in autumn

and winter in the hoards collected by the wood-mice in their nocturnal roving, and piled together in a deserted bird's nest, or on some nestlike cushion where the falling seed-plumes of the wild clematis have collected among its pliant bines. As autumn goes on, the store of unopened seeds decreases, and the gnawed litter grows more abundant; but the wood-mouse is a wasteful feeder, and many sound seeds are left hidden among the husks, or spilt on the ground beneath.



SQUIRREL WOOD-MOUSE
NUTHATCH

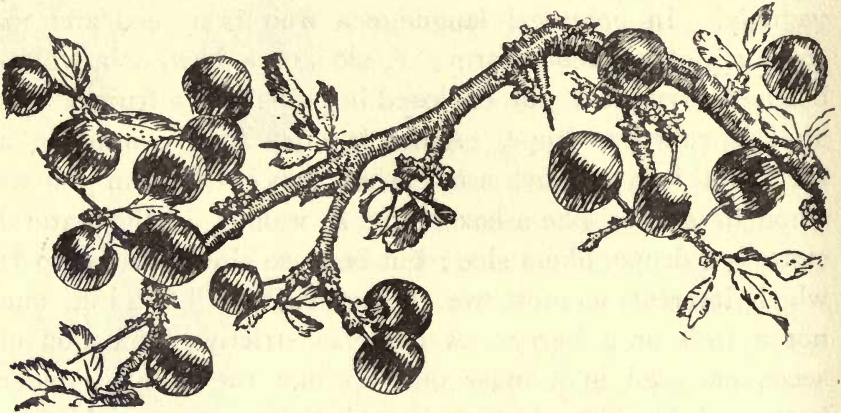
The work of the wood-mouse can be recognised on these opened seeds and stones by the fineness of the hole through which the kernel is extracted, and the very delicate marks of its teeth. Traces of many different creatures can be found in the shells scattered among the dry leaves in the bottom of wide hedge-rows, and in the heart of a mixed thicket. Squirrels crack nutshells into irregular fragments. Dormice gnaw them at the edge of the rough patch at their lower end, and make a neat round hole extending up the

side, through which they extract the kernel. Wood-mice drill a hole at the top. Nuthatches fix them into crevices in posts, or the bark of trees, and hammer them to pieces with their bill; and the ground beneath oaks and some other trees with deeply furrowed bark is often found sprinkled with fragments of different shapes, according as the nut has been split or roughly shattered. Great tits split the stones of yew and hawthorn and whitebeam berries in a less skilful way, by holding them in their bills and hammering them on a bough, as thrushes break snails' shells on

stones. The sound of this operation can be heard a considerable distance through the woods on quiet days, and may be mistaken for the heavier and more deliberate strokes of the nuthatch. The pulp of sloes seems to be too sour and acrid to appeal to any bird. But hawfinches feed on the kernels, crushing the stone with their huge conical bills; and when the fruits have dried and fallen, the stones are attacked by wood-mice, and probably by dormice also. Fruit and nut and seed and berry are terms which we usually apply rather vaguely. In botanical language a fruit is a seed and its covering, of whatever form. A sloe, or a haw, or a white-beam 'berry' is a nut enclosed in pulp; and a fruit of this kind is called a drupe. A nut is a dry shell containing a seed; and it is as much a nut when it is enclosed in pulp as when it is bare, like a hazelnut. A walnut, in the natural state, is a drupe, like a sloe; but because the nut is the part which interests us most, we do ordinarily call it a nut, and not a fruit or a berry. A berry is strictly a collection of seeds enclosed in a mass of pulp, like the holly or elder berry. A blackberry or raspberry is thus a group of drupes; while a strawberry assumes the extraordinary aspect of a group of nuts set on a mass of pulp. The variety of Nature plunges a strictly logical terminology into almost as many difficulties as ordinary careless speech. But it is well to realise the relation of one kind of fruit to another, and not be misled by the importance, for human purposes, of the different parts. The peach is only a larger and softer almond; but because we eat the pulp of the peach and the kernel of the almond, we call the former a fruit, the latter a kind of nut, and forget that they have anything in common.

Sloes are occasionally so abundant as to tinge a whole hedgerow with purple when seen from a hundred yards away, but in some seasons the crop almost entirely fails. In spite

of the belief which still prevails that an autumn rich in berries foretells a hard winter, it is hardly necessary to point out that there is no such connection. The abundance of every kind of berry depends on the weather in the previous spring, when the blossom was fertilised, and the young fruit was setting; and there is no meteorological rule by which mild weather in April or May is followed by a rigorous winter. The idea that provision is made in this way for the



SLOEBERRIES

birds in a hard season ignores the fact that migratory birds in winter are not tied to any one district or country, but range over wide territories in search of food. It is not necessary to look far back to find a striking contradiction of the theory; for the autumn of 1911 was one of the richest in all kinds of fruits and berries ever known, and the following winter one of the mildest. Nor is this a solitary exception; there is not even a superficial appearance of truth about the idea. Subject to favourable weather at the critical moment of blossoming, a luxuriant crop of wild berries is most likely to follow a very poor one. The trees seem to store up energy in a season in which they ripen little fruit; and

Nature is apt to make good its general average by a surprising outburst of vigour. There is a great sense of delight in an autumn in which every wild tree and shrub is loaded with fruits and berries after its kind, and the earth beneath is strewn with the shakings of their boughs. It is good to see the earth heaped high with harvest, even though much of the increase brings no profit to the purse or the granaries of man. Blackbirds make festival over the fallen crab-apples yellowing the mire of the lanes, where a scent of the earth's October wine streams down the wind in the dusk. Squirrels crunch the winged bunches of hornbeam seeds, balancing among the bending twigs; and the herds of swine bring back a forest picture of earlier days, as they rove in the October sunshine, and champ the thick layers of oak-mast or the fallen chestnuts. Rooks and wood-pigeons and pheasants gorge under the oaks in the quieter fields; and flocks of bramblings and chaffinches flicker under the beech-trees in quest of their ruddier crop. Birds and beasts hold harvest-home all the shortening day; and when night falls, the busy mice collect their stores till morning, and leave the linnets' nests fuller in the hedgerows. Under the hunter's moon the moist woods breathe the exquisite aroma of dissolving oak-leaves, most tonic of all the perfumes of the year; and deep in the sighing lanes the acorns still patter in their fall.

Early in autumn the scarlet berries of the cuckoo-pint begin to ripen in the lee of the hedges, and the thinning herbage of October sets them gleaming above the new-fallen leaves. Conspicuous in early spring, this wild arum is eclipsed, like most other spring hedgeside plants, when the herbage begins to shoot high. But unlike the primrose and bluebell, of which little is seen again until spring, the cuckoo-pint finds a second period of conspicuousness in its

seed-time. The same is true of the stinking iris, or gladden, which grows freely in many chalk and limestone woods, and on clay cliffs. The veined, exotic-looking blossoms open about midsummer, and their flower-time is over early in July. By October the pods burst, and reveal rows of bright scarlet berries; and these grow more and more conspicuous as the pod-husks wither into leathery blackness as winter goes on. The seed-heads of this iris are more vivid though



FRUIT OF WILD ARUM

not more striking than the flower. Most remarkable of all is the autumn splendour which comes over the spindle-tree. In spring and summer it is a mean and scanty shrub, with small greenish-white blossoms and dull leaves which are particularly subject to the ravages of sawfly larvæ. In autumn all is changed: the leaves turn a brilliant crimson, but they are outshone by the beauty of the berries. At first these form light clusters of carmine-red; but soon each lobed fruit splits, and shows inner seeds of brilliant orange, set in the carmine shell. If spared by birds these linger long on the twigs, and shine in the naked hedge-rows. No more brilliant winter picture could be seen in England than one which comes back to memory of a troop of half-wild golden pheasants climbing among the spindle-trees in a snowy wood, and tearing at the pink and orange berries.

Sand-dunes, marshes, and mountains foster berries of their own peculiar kind. On sandy coastlines the orange berries of the sea buckthorn ripen in late summer and early autumn among its hoary leaves. The contrast is beautiful and unusual; for though the silvery colour of the leaves

resembles that of the sea-poppy and sea-holly and garden lavender, and many other plants which grow on a dry soil in the reflected glare of the sun, the sea buckthorn is the only member of its family in Britain; and its berries are unlike any others. It has no kinship with either the common or alder buckthorns of inland hedges and thickets, and its narrow silvery leaves, at first sight, make it look like some

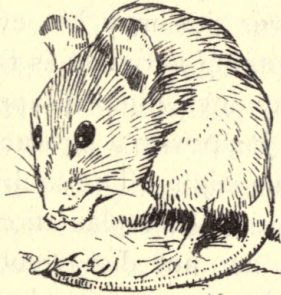


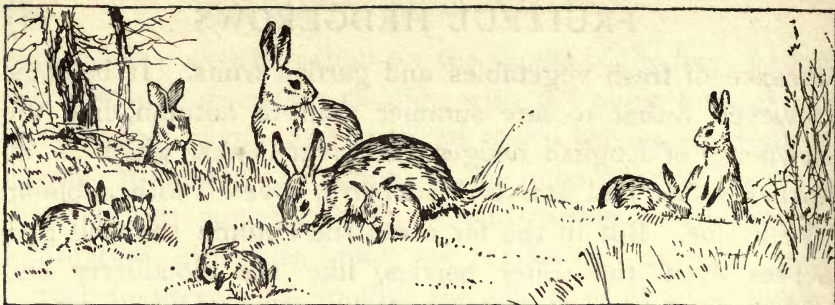
SPINDLE-TREE

species of willow. High woods and mountains have an abundant and characteristic series of berry-bearing plants, most of which are plentiful at lower levels over a vast tract of land in northern Europe and Asia. Besides the bilberry or whinberry or whortleberry or hurt—as it is called in different parts of the country—many high-lying tracts abound with the black crowberry and the red crowberry and bearberry. The shoots and berries of all these plants form a considerable part of the food of the red and black grouse and of the ptarmigan, though the red grouse, at any rate,

depends to a greater extent on the shoots of the ling. Ling and purple bell-heather combine with the paler bells of the cross-leaved heath, and with all these berries, to form a typical mountain vegetation in the mountainous parts of these islands, and on lower ground further to northward. Vegetation descends, like the snowline, as one gets further to northward, so that the plants of English mountain-tops may occur almost at sea-level in Lapland or Siberia. The crowberry plant is easily recognisable by its small round black berries ; it has finely cut leaves, much like those of the bell-heather, though juicier looking and of a brighter green. Cowberry belongs to the whortleberry tribe ; the leaves are smooth and evergreen, and the scarlet berries grow in small clusters. Bearberry is extremely like it in general appearance, though it is more closely allied to the heaths. It can be distinguished from the cowberry by the top of the berry being perfectly smooth, while the cowberry has the little scar, or 'eye,' which marks the position of the withered blossom, as in the currant or gooseberry. The great bilberry, which occurs in some of the more northern and mountainous parts of the country, is rather larger than the common species, and has grey-green instead of yellow-green leaves. The berry is larger, but more tasteless. The cranberry and cloudberry are two of the rarer mountain berries in these islands, though two species of the former are often sent to our markets from abroad. The cranberry belongs to the whortleberry and cowberry family, and is distinguishable by its slender, creeping stems as well as by its crimson berries. The cloudberry is like a large pale yellow raspberry, and belongs to the same tribe. It grows in bogs and wet hollows on a large-leaved plant a few inches high, and is a very delicate fruit ; eaten with cream, it is almost better than the strawberry, and in many wild regions abroad is doubly welcome from the

absence of fresh vegetables and garden fruits. It belongs, however, rather to late summer than to autumn, like the dewberry of English hedges and river-banks, which is an earlier, softer, and scarcer blackberry, covered with a bloom like a sloe. But in the far north the autumn snowfall preserves even the softer berries, like the cloudberry and cranberry, fresh and undecayed till spring; and they form a valuable food for many kinds of birds when the next year's thaw releases them from this natural cold storage.





THE WINTERERS

It has been questioned whether our English countryside is more populous in winter or summer. The coming birds take the place of the departing birds and the general average is maintained. However this may be, every naturalist feels that his world is emptying very fast as the hours of sunshine diminish. Every day, mysterious disappearances take place. The frogs no longer jump with a pleasant plop into the river as you walk along the edge. The squirrels that not so long ago were raiding your filbert plantations or frisking about the adjacent deodar are not discoverable anywhere. You can no longer play the game of cheating the bats by throwing up small gravel stones for them to hawk at, nor listen for the squeak, pitched so high that few people can hear it at all after their 'salad days' are over. The bees are gone, the wasps are gone, and you begin one day to realise that thousands of creatures have done of themselves what the farmer has done with his stock.

They have retired to winter quarters. Soon you may travel many score of miles along any railway and have trouble to find a field that is not emptied of all domestic animals, so empty are the haunts of the naturalist. In more northern lands the race of living things seems quite to disappear.

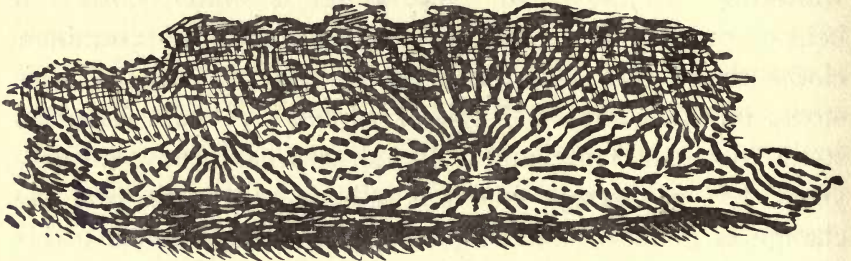
The fields themselves vanish under snow. The beasts are all close cooped up, and will come out in spring thin and weak and almost blind, as if they were experiencing a resurrection. It is a place 'where no birds sing.' Life in England does not vanish with this completeness. The robin and wren and thrush will sing. The honeysuckle and blackberry are in leaf. The rabbits line the spinney-side morning and evening.

Yet almost every living thing even in England prepares against winter in some degree. One may call the putting on of the winter coat a sort of hibernation: it is a method of wintering. In the north where winter is winter, birds and beasts, ptarmigan, or willow grouse, hares and ermines, clothe themselves in white. Sometimes in some measure stoats in the south of England whiten. A very beautiful stoat, just half white and half red, was captured not many years ago in Surrey; but it is only in the north that the change is general. It has generally been supposed that this seasonal change is an example of protective coloration. The ermine whitens because the white coat is an aid to hunting. The hare whitens because it is less easily seen by the hunters. But it is more than doubtful whether this is the master reason. The change is probably correlated with a general alteration of the tide of life. The old hairs whiten in some cases, while in others new white hairs take the place of the old. The white coat is in nearly all cases warmer than the dark coat, and there is some reason to believe that it affects the wellbeing of the animal quite apart from any effect in protecting its life from violence or helping it to food.

The whitening ptarmigan as certainly makes ready for winter as the swallows, who migrate, gathering very obviously together to give one another nerve for the great journey. It was once held, even Gilbert White had

his doubts, that some of the swallows hid themselves in mud, like the pike and the frogs, or in rotten wood like the bats. It is a question whether one action is much more strange than the other. Hibernation is, at any rate, a parallel marvel to migration. The trouble with animals is to find food and warmth in winter. One set surmount the difficulty by chasing the sun. Another by reducing vitality to such a point that food is unnecessary. A third, taking a yet more simple course, die.

The winter sleep is very like death. Pull away a panel of loose bark and see underneath the almost scorpion



'A CURVED PANEL OF LOOSE BARK'

pattern, that tells its own tale. The moth grooved a tunnel for her eggs; and in the mouth of the tunnel 'died sweetly, her end accomplished.' In the spring, the young emerged from either side, tunnelled their way to freedom, leaving the pattern of their paths in perpendiculars to the central groove where the eggs were laid. If one is lucky one may find in the moss at the foot of the tree a queen wasp sleeping on to the winter. How little difference between the wasp and the moth, save that the fertility of the one gives her some heat of vitality which will keep her alive through months of storm and cold.

The law of hibernation is not very precise in detail. We cannot quite say that these creatures hibernate and those do

not. The house-fly and the butterflies ought, if one may say so, to perish before the face of the first frosts; but quantities live through the winter in a state that is neither sleep nor waking. We discover several scores of flies crowded behind a piece of wallpaper that had come loose in a half-deserted room. Some butterflies, such as the orange tip, live a very short life, often only a few days, though one can see no special tenderness in their structure.

Round some species a hot controversy rages; and no one knows whether they hibernate or no. They are in the position of the swallows in Gilbert White's day. But as knowledge grows we find more and more instances of wintering butterflies. Every naturalist has found in odd crevices stupefied specimens of the common admiral. With many it seems just an accident. Here and there a specimen settles down into a warm corner and being well treated by enemies and weather tastes a second summer, and the race is protected by a double safeguard. With the wasps, which run a heavy risk even after they emerge from sleep, one almost wonders that now and again the whole race is not annihilated, so precarious is the hold on life and so flimsy the protection. It is among the strangest of natural devices, that the female, nursing her own fertility in lonely retreat during these long hard months, should awake in the spring to find by her unaided efforts a vast colony, all of whom, again save selected queens, perish at the breath of autumn. You may always find the last of the colony, the queen excepted, feeding on the ivy flowers in sheltered but sunny spots. Ivy is always a happy hunting-ground; and October is the month. The belated flowers then come to bloom, and about them cling, in the last torpid struggle for life, the last of the wasps and flies and the most energetic bees. To quote a personal experience: 'There was one little clump of

ivy alongside a lamp shed on a little country station where I have found wasps many weeks after the last of them were thought to be dead. I have never seen them in December,



IVY FLOWERS

but very often found one or two during the last days of November.' The flies usually outlive the wasps. The thin watery sunshine of a December morning will catch the metallic blues of the bottle-fly crawling slowly over the leaf

showing a not less metallic surface. By midday the fly may discover just enough energy to crawl up a fruit head and search, probably in vain, for a last grain of pollen among the black-headed pins of fruit.

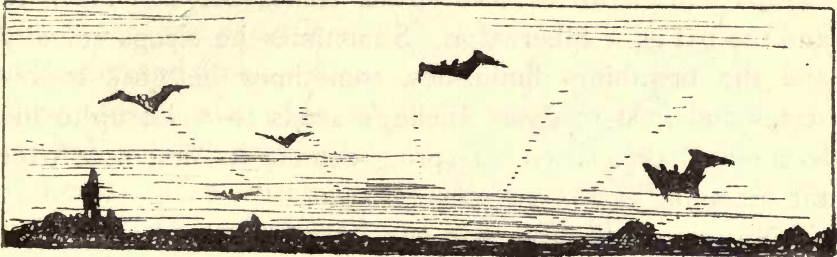
The haphazard wintering of the flies and some butterflies, even the solitary wintering of other creatures, is very different from the organised wintering of the honey-bees. Of all the sounds in nature, none is more suggestive than the high-pitched vibrant hum which you can just hear if you put your ear to the hive. The bee has as strong and insuperable an instinct as any creature. But the course of this instinct is also the course of reason and has the appearance of it. In the hive proceeds all the military preparations for a long siege. Food is served in minute rations. Water is procured only when winter is ending and the queens demand it, by the agency of as few water carriers as possible, who are absent from the hive for a short while and only when circumstances are favourable. Warmth is conserved to the utmost by close packing; and health in such crowded quarters is maintained by the ventilation of many wings working as an electric fan works. It is the hum of the ventilator one hears. Doubtless the tide of life, perceptible indeed in inorganic as well as organic things, ebbs in the bee as in others. In winter, the hive bee, as the bumble-bee, sinks in vitality and can live with less food and less activity than when the days are longer. Nevertheless, in the bee, the organisation, the definite methods of meeting winter, are more obvious than the intrinsic adaptation of the physical qualities. It is not so with other insects.

In October most of the winterers prepare their retreat. On the whole the insects, perhaps, sleep hardest; but few creatures look so dead as the bat. Old barn roofs are a certain covert where one will never draw blank; but the bats

will choose almost any quarters that are dark and hidden. They are very fond of the old hollowed scooped willows, growing in pollarded shape along the brooks. In there you have to dig them out of the half-rotten wood into which they burrow, such is the writer's experience; but they are supposed as a rule to hang themselves up. If you climb to one of their haunts where suitable beams provide a hooking-place, you will see, if you peer close, a thing that looks as lifeless as a withered lichen. The creature hangs upside down, as if it were preserved like bacon on a kitchen chimney. It might have been nailed there as a keeper nails weasels to a tree. Life is indeed very nearly extinct, so far as tests go. The heart beats only just perceptibly, the temperature sinks to the limit, sight and hearing probably cease. But the dormancy is not that of the lily bulb which must pass through its period. Exceptional weather will wake the bat, and for a few minutes one springlike evening it will fly out into an early air quite devoid of insects; and after a few minutes' vague hawking will return to the intermitted sleep. But the varieties differ. The little pipistrelle, which is the commonest, wakes more easily than the noctule, which begins its winter sleep as early as August, it 'æstivates' as well as hibernates and 'diurnates,' or, if English words are allowable, it summers, it winters, and it sleeps by day. Like the flies, the bats, especially the pipistrelle, winter in companies, often clinging on to one another, as Homer, among other naturalists, noted and described in haunting lines.

Some scientific writers say that the hedgehog winters in a state of deeper coma than even the bat. This is not agreeable with experience in a Midland county where hedgehogs greatly abounded. It was quite easy to find them hidden under the mossy snags of coppiced bushes

within some open spinney. If you came upon one in autumn he was very fat; and there were people in the neighbourhood who regarded the animal as a table luxury. If you found him late in the winter he was very thin, and it is reasonable to infer that the ordinary processes of life went on much more actively in the hedgehog than in many other winterers, certainly the bats and frogs and fish. A warm day of late November would bring them out from



BATS

under the snag; and they were afoot in spring as soon as spring growth began.

Possibly observers have exaggerated the depth of the hedgehog's torpor, because he rolls himself up in a tight ball when disturbed. But the very tightness of the ball is a sign of muscular activity. It is quite easy to tell from the outward appearance whether the ball is or is not tightened for defence.

To some degree almost all animals prepare for winter inactivity. Most birds as well as beasts lay up a store of fat as winter comes on; and upon this fat they can feed for some while if conditions are hard. Turtles will live through a long journey on their own fat. The domestic hen puts on a large weight of fat; and being fed nearly all the winter, whatever the weather, finds trouble to get rid of it, nor does she lay eggs till it is gone, a fact of which the keeper of hens

is too little aware for his own profit. Almost all wild, and indeed domestic animals, can feed on themselves. The sheep, which Jan Ridd in *Lorna Doone* rescued out of the snowdrift, could have lived there quite happily for a good while so long as they could keep a hole for ventilation. Rabbits and hares have been known to lie snug for many days in a snow cavern.

The squirrel who, like the virtuous man in Vergil, 'wraps himself in his own virtue,' comes between the hare and the bat as a hibernator. Sometimes he sleeps soundly and the breathing diminishes, sometimes he goes to his stores and is as ready as Shelley's seeds to wake up to life as soon as 'the clarion' of spring sounds its first note over the dreaming earth.

No autumnal disappearance is more secret and silent than the self-burial of frogs and some fish. More often the winterers one comes across in autumn and winter rambles make themselves snug and comfortable in sufficiently obvious places. The snuggest of all is the dormouse. The writer has found him showing a particular fondness for the upper story of a beehive, the uninhabited attic over the swarm. It is just the right place for him. There is usually cloth or stuffing of some sort put to keep the bees warm through the winter. The dormouse cards and teases this till he has composed a ball of soft wool so evenly distributed that in spite of its lightness it is as effective to keep out cold as the best cotton-wool. Finally he covers up the hole of ingress, leaving as little trace as a hedgehog leaves of his own head and tail. Both

'Roll their sweetness up into one ball,'
as Marvel advised in a different sense, and doze away the winter snugly. Perhaps the dormouse is open to the child's complaint that it 'had no habits.' It is never very lively

or amusing, but it makes things level by its extreme beauty. 'Pearls are not equal to the whiteness of its teeth' was said of a dead dog. One may say of the live dormouse that seal-skin is not equal to the softness of its coat; and there is no brown quite of its colour.

The disappearance of the frogs, and indeed the toads, is a much more dour business; and it is more unexpected. It is more than burial, a more thorough inhumation even than the caterpillars. Sometimes it is as fatal as the experiment of Romeo and Juliet. One often sees on the edge of a pond a little graveyard of frogs—and a miserable spectacle it is—which had died in the mud, from which they should have been resurgent in the early spring.

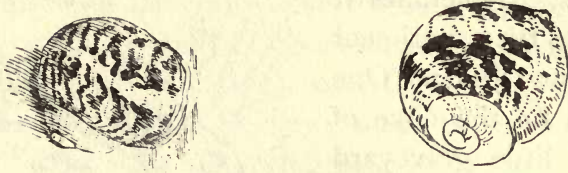
No one has quite fathomed the mystery of some of their disappearances.

A host of stories are current of the longevity of toads immured in rock. Corresponding to these are many country stories, to which insufficient attention has been paid, of the re-emergence of fish from dried river or pond beds. Many fish hibernate in some degree. They do not lose vitality in the same degree as the bat; but they retire in sulky slumber to remote crevices. In Eastern countries there are species which seal themselves up by means of some secretion within mud chambers; and some are convinced that pike or perhaps other fish are capable of maintaining life in the mud for a great length of time. But this is rather 'æstivation' than 'hibernation,' and the fish wait under the caked mud for the rains of autumn.



FROG

But much mystery remains. We do not even know the place of the hibernation, though perhaps the mystery is not lessened when we do. No one knows how far the snail can be said to be alive in winter. He shrinks far back into the shell. Across the mouth he leaves a hardening film that shuts out the elements of life as well as the entrance of enemies. If you broke the film you see a thing that is of the very type of death. Its recovery looks as impossible



as a shrivelled piece of lichen, which may remain changeless, it is argued, for a thousand years. But the lichens will revive at the touch of moisture as surely as the snails to the lengthening sunshine. In them too is symbolised 'the mystery of resurgent eastertide.' It is symbolised even in the snake, which is among the winterers.

'The world's great age begins anew,
The golden years return.
The world doth like a snake renew
Its winter weeds outworn.'





GOSSAMER AND SILK

You may scarcely take an autumn walk and fail to see the signs of a new activity to set against the autumnal loss and failing. Young birds are finding their vigour; migration itself is an example of almost preternatural energy. The minute goldcrest that whispers about the evergreen in the garden, that allows us almost to touch it, and makes no flight of more than a score or two of yards, has just dashed across the North Sea in one ecstatic burst of incredible power. The dragon-flies in their marriage flights embroider untraceable patterns of colour in and about the purple sprays of the hedgerow. Moles and worms, the first ploughmen, turn up the ground, as if just for enjoyment of the yeasty smells and softened stuff. But if there is to be a comparison of activities at this season the spiders perhaps take the suffrages. Indeed spiders are remarkable for activity at many seasons. Country people take their appearance for a sign of foul weather; and they certainly also prognosticate fine weather.

The district to see them is the West of England; perhaps South Wales is the best of all. Walking along the valleys where the furze and broom flourish, you might think that nature designed the spikes and minarets of the gorse for the purpose of slinging horizontal webs. In the dewy morning each is strung with pearl drops, making distinct the

webbing and the general shape even to the ropes that sling the nets. The bush might be a cabinful of slung hammocks. If you peer more closely as the webs dry, you may see on some webs of rather different shape than the majority strings of minuter drops, marking a certain zig-zag thread that joins the spokes together. It is the glue-thread, most fatal to the winged things, a bird-lime for midges.

Whatever we think of spiders the webs are worth study. Even many naturalists have a certain repulsion from spiders and the tribe of scorpions which they include. They are held to be ugly. On occasion the females are beyond question cannibals devouring the males. It is not a pretty sight when the poisoned jaws of the spider meet in a trapped victim. The red spider on the beans is one of the foulest plagues, and the harvest bump rather more than a discomfort. About the spider superstition hangs, though there are pretty as well as unpleasant sayings, as in the favourite French proverb :

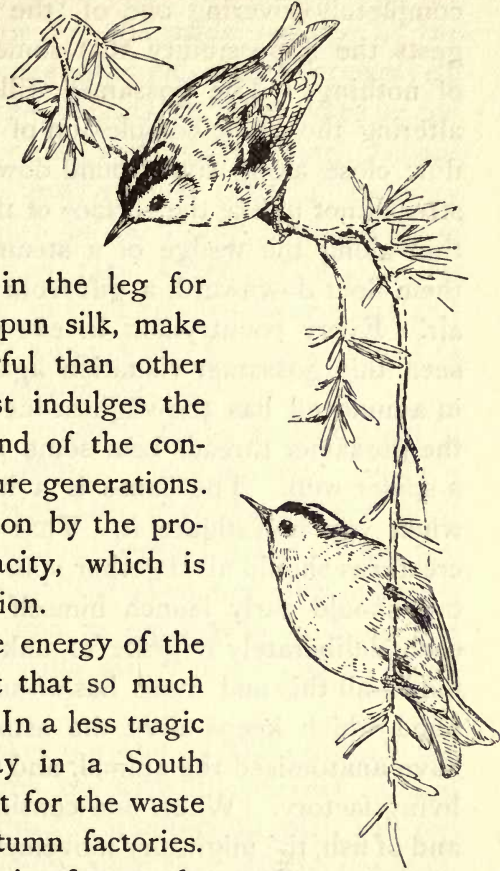
‘L’araignée du matin—chagrin,
L’araignée du midi—plaisir,
L’araignée du soir—l’espoir.’

But the beauty of the spider’s web no one questions. It is as undoubted as its ingenuity. The subject was long ago made popular by those most charming and most old-fashioned entomologists, Kirby and Spence, a pair who wrote more than others out of the fund of their own observation. The geometric spider with its vertical web is the most perfect artist. Like the economy of the hive his work is almost too perfect to arouse any affectionate interest. But watch the process of building and interest returns. There is nothing mechanical or automatic about the way the animal sets to work; and when, as a consummation of the web the bird-limed thread is wattled in and out, and the scaffold-pole threads

removed, one gasps for wonder at such an ingenious, and it seems well-reasoned device. But the horizontal webs of these gorse-builders are prettier; and being less geometric give a greater impression of an adaptive mind, if the word may be used. However, the instinct springs from the irresistible processes of the body. The 'spinners' and 'spinnerets,' and the pincers in the leg for carding and teasing the spun silk, make the web no more wonderful than other wonders. The animal just indulges the free play of life to the end of the continuance of the life for future generations. It is driven to certain action by the propulsion of its own capacity, which is supereminent in one direction.

Edison, looking at the energy of the sea, is said to have wept that so much power should be wasted. In a less tragic vein the merchant astray in a South Wales valley might lament for the waste of good silk in these autumn factories. For the web of the spider is often made of the very finest silk thread imaginable, a silk that no process can produce. It is at least as probable that one day spiders will be drilled to the work of the silkworm as that the tides will be harnessed to the creation of available power.

In early autumn days the race of spiders discovers a new activity, visible enough in the webs of these voracious spiders



'THE MINUTE GOLDCREST
... HAS JUST DASHED
ACROSS THE NORTH SEA'

on the whins ; but it is one of the smaller and less visible species which produce the strangest of autumn phenomena. Until you look into it, the cloud of gossamer, sometimes completely covering one of 'the happy autumn fields,' suggests the impossibility that something has been made out of nothing. The gossamer will settle down like manna, altering the whole complexion of the surface. The strands flow close along the ground down the wind in long-drawn streaks not unlike the surface of the sea where it is stretched thin along the wedge of a steamer's bows. You may see them float downward, a gift from nowhere, out of the misty air. Every countryman in every village in England has seen this gossamer visitation again and again ; yet not one in a hundred has the vaguest idea of its cause, except that the gossamer threads bear some resemblance to the stuff of a spider web. The cause is a little difficult to realise even when you investigate it. That these almost microscopic creatures should all together spin each his parachute or kite tail, should early launch himself forth into the air, should each deliberately migrate to unknown regions in search of food—all this and more has an unexpectedness, an unlikelihood which keeps alive the astonishment, even when you have anatomised the animal, and learnt all the parts of the living factory. When one considers the migration of birds, and of fish, the migratory movements of lemmings, of rats and of shrew-mice, the dispersal of seed, the up and down patrol of the sap, such sudden common movements as these young spiders make, one begins to regard autumnal migration or its equivalent as an attribute hardly less integral to the common plan or design in nature than some of those more familiar structural and functional similarities which bridge the extremest differences between the vegetable and the animal kingdom.

It has never been quite satisfactorily explained why the spiders develop this seasonal activity. No doubt the mists that settle down over the surface of the country bring with them little insects of many sorts, and it is probable that the gossamer spiders skim low for the same reasons as the swallows. The birds and the arachnids share successively in the same chase. As the one departs the other takes up the hunt. No doubt too many of the spiders are young, perhaps three months old, and have just reached their full capacity to make these kite tails just as the young swallows have learnt the proper art of using their wings. The spinning and the '*remigium alarum*' in both arts need some age and some skill. But not all the spiders are young, and food is not found near the ground only in autumn.

The phenomenon of the gossamer flight may be seen in town as well as country. Minute black spiders, one of a number of varieties that play this part, have been seen climbing the railings in London parks. Once at the top they stand in such position that the spun web flies out most suitably down wind. As soon as enough is paid out the spider takes the leap and sails away like a kite to lands unknown.

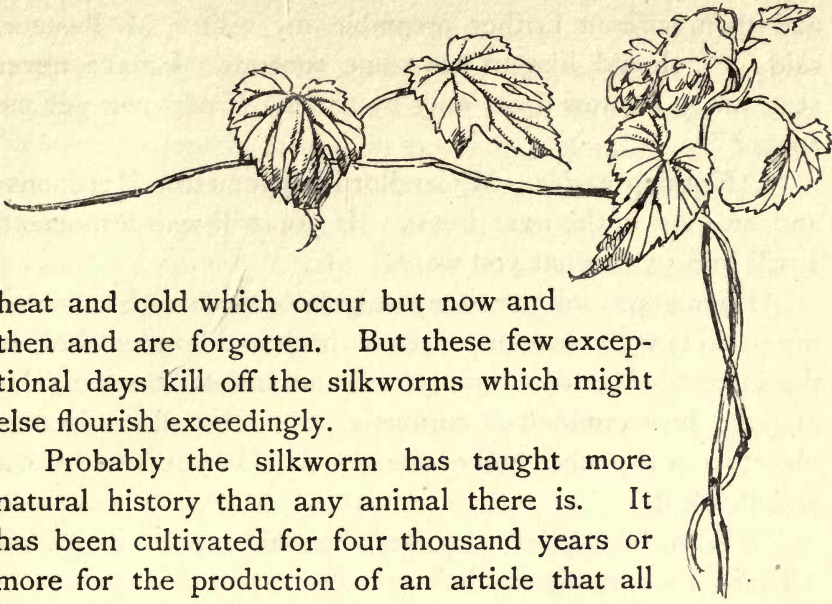
In the country people have tried many times to trace the first flight from a hedge or tree, but with little success. Often the flyer starts from no better vantage-point than the top of a tall grass, and one would infer that this is the rule. Iron railings are perhaps more tempting than a hedgerow.

However, in general the spider's use of height or depth is one of the most effective promptings of its instinct. If it is desired to bridge a wide and deep gulf, the spider will tumble down from her height to the lowest possible point, spinning as she falls two threads, one stout, one light. The lighter is loosed; and if it catches a lucky breath is lifted across to the

farther bank, where it clings by virtue of its own stickiness. The spider climbs aloft again by the stouter rigging to find that rocket apparatus has successfully thrown the rope to the desired goal.

How clever! but the word seems the wrong one when in another month one goes out and sees the hop-bine bridging similar heights in much the same manner and with as true an instinct for direction. What does it all mean? Darwin told us a little; much more than any one else. Doubtless very pat explanations have been written. 'The engineer,' so they put it, 'who throws the bridge across the Zambesi Falls has a brain which works by reason. The spider which weaves the two webs has, instead of brain, ganglionic centres from which instinct emerges. The hop-bine has irritable cells which respond to stimulus.' Doubtless the tale is true; and those to whom it gives satisfaction are welcome, if they wish, to cease wondering. After all 'ganglionic centre' is a great and satisfying phrase, and is good anatomy.

Indeed the production of silk, in what may be called the manufacturing months of autumn, is vast. The silkworm is only one of scores of species of insect and of spider which produces silk of the finest quality; it is indeed a singularly complete example of all that is characteristic of the common moths and butterflies. It is a sort of text-book example of the type. Many children have kept silkworms and learnt to appreciate the rest of insect life through them; even Milton, who was a child in these things, knew about the silkworms. His *Comus* talked of men who loved 'to set to work millions of spinning worms that in their green shops weave the smooth-haired silk.' The worms flourish perfectly in England for a certain period, and many people have tried to start an English industry. But 'the third day comes a frost—a killing frost.' In England we have sudden visitations of



THE HOP-BINE
BRIDGING

heat and cold which occur but now and then and are forgotten. But these few exceptional days kill off the silkworms which might else flourish exceedingly.

Probably the silkworm has taught more natural history than any animal there is. It has been cultivated for four thousand years or more for the production of an article that all this while has been the most popular and valuable of stuffs. The regular progressive changes of insects through their several forms, each singularly unlike the other, make one of the cardinal wonders of a very wonderful world. Indeed as we descend in the scale of life the miracle of life seems to increase in strangeness. Yet to the most learned, even to the most scientifically learned, some of the common plans of natural history are often unsuspected. There is a most delightful passage in an essay of Fabre's, who, if the superlative may be permitted, was the very best writer on insects and spiders that ever lived. Apart from his acute powers of inference, working on the closest observations, he plunged into his subject with a relish that influences every word he writes.

Well, M. Fabre was astonished one day in his humble house by a call from the great Pasteur; and the following dialogue took place:—

'A few words were exchanged on the prevailing blight;

and then, without further preamble, my visitor, M. Pasteur, said: "I should like to see some cocoons. I have never seen any; I know them only by name. Could you get me some?"

"Nothing easier. My landlord happens to sell cocoons; and he lives in the next house. If you will wait a moment, I will bring you what you want."

'Four steps took me to my neighbour's, where I crammed my pockets with cocoons. I came back and handed them to the savant. He took one, turned and turned it among his fingers; he examined it curiously, as one would a strange object from the other end of the world. He put it to his ear and shook it:

"Why, it makes a noise," he said, quite surprised. "There's something inside."

"Of course there is."

"What is it?"

"The chrysalis."

"How do you mean, the chrysalis?"

"I mean the sort of mummy into which the caterpillar changes before becoming a moth."

"And has every cocoon one of those things inside it?"

"Obviously, it is to protect the chrysalis that the caterpillar spins."

"Really."

'And without more words, the cocoons passed into the pocket of the savant, who was to instruct himself at his leisure touching that great novelty, the chrysalis. I was struck by this magnificent assurance. Pasteur had come to regenerate the silkworm, while knowing nothing about caterpillars, cocoons, chrysalises or metamorphoses.'

Pasteur's ignorance is very common: we all share it

more or less. Even the most persistent entomologists are continually astonished by unexpected discoveries.

There are many such discoveries yet to be made among the silky cocoons concealed in every sort of nook and crevice—in the bark of trees, in the roots, on wood palings, under stones. The commonest of all is the cabbage white which hangs itself up very neatly, almost in a hammock. But the silk is used in a hundred ways, to swing the spider or catch its flies, or to spin a moth's cocoon or to line a hole.

What most astonishes the Pasteurs coming with delightful freshness to these subjects is the very short time during which in many creatures the chrysalis stages last. There are some cocoons designed to hold the pupa through winter months; but often, as in the silkworm, the chrysalis stage is surprisingly short considering the astonishing transformation which proceeds. An egg, usually laid so that it adheres to the leaf which is the caterpillar or worm's natural food, may lie through a winter, though often, as again in the cabbage white, they may hatch between spring and early summer. The caterpillar may live in the grub state for years as does the goat hawk moth grub which burrows into our oaks. The perfect butterfly or moth, though usually it is ephemeral, may safely hibernate through the winter, as always do some of the *Vanessæ*; but the chrysalis case in which the supreme transformation takes place is as a rule only designed in spite of its perfection to last a few weeks. A silkworm cocoon might be a life work. The design is perfect. The outside of the case, in which the twin threads are woven tighter, more compactly than the rest, is designed to case-harden; it forms a crust, a sort of egg-shell, as some one said, for the soft interior, which is as warm and snug a couch for the nursing of the coming Imago as ever the spiders swung for Titania. Case and couch

serve for just as long as a hen's eggshell. In three weeks the silkworm, as ugly as useful, has become the perfect moth. The specialised apparatus, differing in a hundred species, for opening the case is brought to work and the moth emerges. At once the sexes find one another, in a day or two the eggs are laid; and the parents as a rule die with little delay. Sometimes their dead bodies serve, as Caesar's, to 'stop a hole to keep the draughts away.' The common bark moth often, but not always, dies in the mouth of the tunnel along which her eggs are laid. In almost all cases the male dies at once. M. Maeterlinck has made common property the fact of the death of the bee selected by the queen. He dies by force of his own energy. In very many scorpions the female at once kills and often eats the male; and the house-spider is as ruthless. Sir Herbert Maxwell horrified quite a large public by describing in great detail the tragic fate of a series of husbands of a certain vast house-spider. Her venomous hate of the male, whether or no the accepted suitor, has been a theme for years. It is the very final example of the law of nature by which everything is sacrificed to the continuance of the species. The male dies the moment his end is accomplished. The marvel is that the fear of the tragedy, which quite obviously has a place in the imagination of the male spider, does not deter. However, he has at least the chance of escape, while the scorpion, it seems, does not as a rule even make the attempt. The scorpions are, of course, allied to the spiders, and it is in this savage race that the destruction of husbands prevails. The spider needs vast amounts of food for the production of silk and nothing is rejected. They eat their own cast shells, and it is but a small advance in cannibalism to eat their own species.

The spiders and moths have no racial affinity, but, greatly

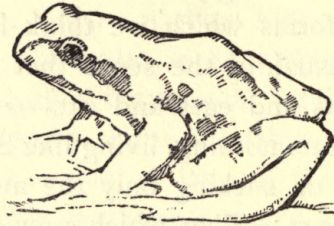
as they differ in classification—the six-legged insects and the eight-legged arachnids—the general similarity of nature's plan is very striking especially in this art of silk manufacture. Both produce silk in tubes and a viscous fluid along with it. In one stage of the silkworm's life the fluid and the silk together form the very toughest and finest form of catgut made. Both tease and card and distribute the silk through 'spinnerets' set at the end of the tube. Possibly the first use of the silk in all cases was for a cradle and a home. The butterfly uses it still for no other purpose than to protect over the critical weeks the transforming grub. 'Behind the veil,' the silken veil, the mystery develops. Forms that we think ugly in form, if not in colour, are transmuted into forms which we think lovely. The beast that is purely sensual, in the sense that its whole vocation is voracity—it eats and eats and eats—unfolds into a fairy thing that either eats nothing, living like Shelley's chameleon on light and air, or sucking only the most delicate nectar from rainbow flowers. That which crawled on the earth or below it, sometimes, as in the cockchafer grub, so weighed down by its own belly that it can do no more than heave itself along from grass root to grass root, suffers an air-change into a thing almost bodiless, with wings so wide in their sweep that it must aspire upward as the other must fall downward. They carry the new being in a wayward patrol up to the tree-tops and over in a path as untraceable as the downward chassé of a snowflake. The stored energy of long months of material life is suddenly expressed in a blaze of shapely glory, as when a flame bursts upward from the barren pith cells of a log or the blackened inertness of a carbon lump.

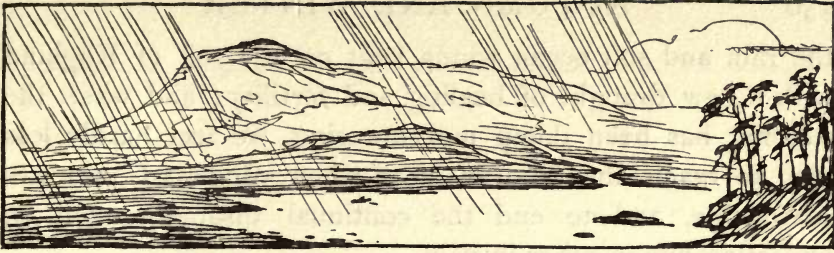
'The flame of the soul burns upwards.' There is a competing symbolism in this air-change, wrought quickly and most

perfectly behind the silken veil, that lets through only so much of air and light as life demands and keeps out the cold and dust and profanity of other earthborn things.

‘Blow, blow the clarion, sound the fife!
To all the sensual world proclaim:
One crowded hour of glorious life
Is worth an age without a name.’

The symbol of the emergent chrysalis is enough to excuse the martial quotation.





AUTUMN RAIN

ABOUT the beginning of October a great change usually comes over the weather, with the arrival of what are commonly known as the equinoctial storms. The autumn equinox falls on September 24; and neither that day nor those immediately preceding or following it are marked in any long series of years by exceptionally stormy weather, so that the idea of the equinoctial storms is often quoted as a popular fallacy. But none the less a period of gales and rain does usually set in about that time in autumn, forming a marked contrast with the calm bright weather which is typical of early September; and it is natural and not very misleading to date this revolution of the seasons by the chief landmark at this time of year, though it is doubtless more correct to speak of the autumn storms, and thus to avoid the suggestion that the stormy weather has a definite connection with the equinox. When the weather breaks up at this time of year the land seems given over to the Atlantic winds and rain, which strip the woods of the outworn vegetation of summer, soften the cleaned fields for the autumn ploughing, and fill the pools and streams for the needs of the coming year. There is a fine exhilaration and refreshment about this wet and turbulent season, whether the weather of the summer and early autumn has been foul or fair. After the long heat and sunshine of a dry summer,

the rain and soft ocean winds beat on the soil of England with a new draught of healing and fertility; and when the summer has been damp and lowering, we feel hardly less glad to reach the time of year when wind and rain are seasonable, and to end the continual disappointment of expecting fine weather in vain.

The autumn sense of being merged in the rains of the sea is not a mere fancy, but is strictly true to the meteorology of a normal year. England lies on the frontiers of two great systems of weather which are perpetually advancing and receding across our borders for the greater part of each year. It is this peculiar situation which makes our climate proverbially so uncertain. A great anticyclone, or system of fine weather, is normally centred to the south-west of us in the neighbourhood of the Azores; and a cyclonic or stormy system has its seat to northwards over Iceland and Greenland. In a normal summer the Atlantic anticyclone over the Azores spreads northwards and embraces the greater part of our islands. This staves off the series of cyclonic systems which normally coast along the borders of an anticyclone, sending them spinning north-eastwards over our far north-western coasts, or outside our area altogether. In autumn the Atlantic anticyclone contracts; the limits of settled fine weather recede to Portugal or Madeira, and the Iceland and Greenland depression expands over Britain. The storms passing from the western Atlantic along the northern fringe of the great anticyclone now find our islands in their path; and we are drenched with their abundant rain. The term anticyclone simply means the opposite of a cyclone; and a cyclone in meteorology means any storm-system with a revolving or eddying motion, and not only the very violent revolving storms of the tropics to which the name is more familiarly

LIFTING POTATOES

By HARRY BECKER



applied. The difference between the shallow cyclonic depressions which bring a day's light summer rain in England and the destructive storms of the tropics is simply one of degree. Cyclones are characterised by the thinness of the air in their midst, and by the inrush of air from outside to fill the vacuum; a rough mental picture of their structure and motion may be gained from the revolving eddies which sweep downstream past the piers of a bridge in a flood or a strong ebb-tide. The thin air within them exercises a comparatively feeble pressure on the column of mercury in a barometer; it therefore sinks, and we speak of the barometer being depressed, and of the system which causes it as a depression. Additional appropriateness is given to the phrase by the fact that an anticyclone consists of a great pile or mound of air, while the centre of a cyclone has a comparatively thin layer; compared with the structure of an anticyclone, a cyclone is a depression from this point of view also. It is the agglomeration and compression of the air in an anticyclone which causes the high pressure, as marked by the barometer; and the comparative rarity of the air in a cyclone which brings the barometer down. The inevitable tendency of the compressed air to flow into the eruptive eddies causes the cyclonic winds; and thus cyclones and anticyclones are indissolubly linked.

Cyclonic systems in our latitudes generally, though not invariably, move from west to east; and the on-coming of an autumn gale is marked by definite and well-known features. Often the first sign on a clear October morning is a shift of the wind to the south-east, or a wind unexpectedly springing up from that quarter out of a frosty calm. It is the first suck of the air into the depression still many miles away; and as it is drawn from the Continent or the cold North Sea, it is generally chilly. The sun gradually fades in a formless

haze, which presently thickens into ill-defined grey cloud. The wind drops, and capriciously springs up again from the south-west; pale woolly clouds hang under the darker grey, and the first drops of rain begin to fall. The sky darkens, and tearing gusts sweep up dust, paper, and leaves; the rain comes on more heavily, and the wind blows harder and harder from the south-west. The elms groan with their long south-westerly music, and the rivulets tear channels through the carpets of leaves in the lanes. The length and fierceness of the storm depend on the size and intensity of the depression, and on our nearness to its centre; but sooner or later the rain falls more heavily than ever, the wind shifts towards the west or north-west, the air grows colder, and with a few more showers the rack of cloud breaks up into open masses, and the sun or the stars shine through. The cyclone has passed, leaving the beech boughs half stripped but shining, the rivulets running thinly down their last night's courses, and the summer grass submerged in the ponds.

The general movement of the wind currents in a cyclonic depression in the northern hemisphere is in the opposite direction to that of the hands of a watch, or of the sun. But all cyclones, at any rate in temperate latitudes, do not merely revolve round and round their centre of depression; they are gradually sucking in air from outside as they spin, until the depression gradually fills up and disappears from the map. Currents of air curve inwards from all quarters and merge in the general cyclonic circulation. A very simple rule enables us to tell from the direction of the wind on which side of us the centre of the storm is situated. If we stand with our face to the wind in the northern hemisphere, the centre of depression is on our right hand. In the southern hemisphere it will be on the left. In England most cyclones pass to the northward of us, on a

north-easterly course ; and it is the conjunction of the structure and path of a normal cyclone which gives us the characteristic succession of winds. The south-west wind tears past us to bend a little to the left and enter the depression from the south ; and the north-west wind is following up the retreating eddy to bend a little to the left in the same way, and enter it a little more from the west. When we face the south-west wind our rule shows that the depression is to the north-westward ; it is still on its way towards us. As we face the north-west wind, the rule shows the centre of the depression to lie to the north-east ; it is now receding from our shores.

This knowledge of the general route and structure of cyclones in England will help us a great deal to understand and take an interest in the larger processes of the weather. Small cyclones are often very intense ; the violence of a wind depends on the rapidity with which pressure diminishes in a given distance, and the consequent force of the indraught. We can often see very strong but very local cyclonic suction in the eddies a few feet in diameter, which whirl round paper at the street-corners and straws in the stable-yard. In a large cyclone, with its centre speeding across the Iceland seas, the strongest winds may blow from the south-west over our whole islands ; but when the centre of a smaller cyclone passes over the north of England, as it often does, a northerly or north-easterly gale may be blowing in the north of Scotland at the same time as a south-westerly gale on the opposite side of the cyclone in England. The circulation of air in an anticyclone is exactly opposite to that in a cyclone. It radiates outward on a curved path, following the direction of a clock's hands, or the sun. Its typical path is out from an anticyclone, and in to a cyclone in a great double curve like an S ; but this perfect path is usually more or less

interrupted and complicated by the broken state of the weather in some quarter. It is more difficult for an anticyclone to maintain the perfect circulation of its winds than for a cyclone; for the currents rushing in to fill nature's abhorred vacuum are strong, while an anticyclone is a system of settled weather, in which the airs are usually light, and often hardly noticeable.

Cyclones in Britain travel at a rate varying from about ten to seventy miles an hour; and in those which move slowly the regular incurvation of the wind from all quarters is often well maintained. But the observations of the Meteorological Office tend to show that many cyclones do not conform fully to the typical cyclonic pattern. The sudden jump of the wind from south-west to north-west, often experienced as the centre of the cyclone passes, is itself enough to suggest some sharp irregularity of structure. In a fast-moving cyclone the speed and violence of the wind would need to be tremendous, if it completed the full circular course. We do not get such terrible hurricanes in this country; cyclones of this perfection of structure and corresponding violence are reserved for tropical climates. According to the best opinion, the effective air currents in a cyclone are three in number. First, there is a moist warm southerly wind, on the front or east of the depression. In the second place, there is a cold dry east wind crossing the southerly current at a point about opposite to the centre; and the third current blows from the west, and comes in on the south side. If the direction of these three currents is set down as a diagram, it can be seen that they conform to the general pattern of the cyclonic eddy. By the modification of their direction where they meet, the complete cyclonic pattern can be formed from these three elements.

The existence of these three main currents has been

determined partly by study of the daily records of the direction of the wind over the Atlantic and European region, and partly by consideration of the causes which produce rain. According to the present evidence, the rain in a cyclonic depression is due to the meeting of the warm moist southerly current with the cold and dry winds coming from the east and west. When the depression has passed, so that the southerly current on its front has retreated from us, the rain quickly ceases, and the sky clears. The south-west wind which usually blows during the wettest and stormiest period of the cyclone, is due to the fusion of the southerly and westerly currents; and the north-west wind, which is characteristic of the retreat of the depression, is probably the easterly current on the north of the depression curving round to form the current from the west. Where this cold current drawn from the north meets the warmer and moister air to the south of it, it produces the heavy 'clearing shower.'

The same causes which produce rain in the different quarters of a cyclonic depression, influence the rainfall in the different parts of England. Rainfall is heaviest about high ground; and this is the chief reason why the west of England is far wetter than the east. In its hills and high moors gather the bulk of the air-borne moisture. Hills help to precipitate moisture in two ways. Their surfaces are colder than the warm air coming from the southern Atlantic, so that they condense its invisible vapours; and they throw up the air-currents to a greater elevation, so that the vapour condenses by the cooling consequent on reduction of pressure. Both these processes are believed to help in the production of a cyclonic rain-storm. The mingling of the warm southerly current with the cold easterly and westerly currents causes rain, in the same way as the cold

earth-surface meeting the warm air from the sea; and the southerly current thrust up by the incoming easterly one causes more rain by reduction of pressure. Immediately to leeward of a mass of high ground, there is sometimes a comparatively dry, low-lying district: where the next hills rise to eastward, the rainfall increases again.

Wet autumn weather plays a great part in the preparation of the soil for nature's next annual crop. Wind and rain soften and beat down the dry stems and faded leaves of summer's vegetation; and the worms set busily to work in burying the fallen leaves in the damp earth. They are extraordinarily active in wet autumn weather, especially by night; they draw down the leaves into the soil, and also bury them by the digested soil thrown out of their burrows. The soil is fertilised by the leaf-mould thus formed, and its surface is cleansed for the growth of the young blades in spring.

Autumn floods carry the seeds of plants for many miles downstream, and wash them into crevices and hollows high above summer level. So, when spring and summer come, the rocky walls of the torrent are garnished with clinging flowers. When the streams roll furiously in their beds, the eels pass down to the sea on that strange autumn journey to the depths, where they breed and die. But the chief work of the storms is the replenishment of the pools and streams. By the end of a long dry summer the beds of the ponds and brooks are half choked by weeds, and covered by a dry growth of turf. The first task of the autumn rain is to reclaim the lost ground. It is curious to see how quickly a grass-grown watercourse loses its carpet of verdure in wet autumn weather. A few hours after it is first filled by a rapid current, the grass-blades are all strained in the same direction downstream, and flattened into a discoloured film.

POTATO GATHERING

By HARRY BECKER

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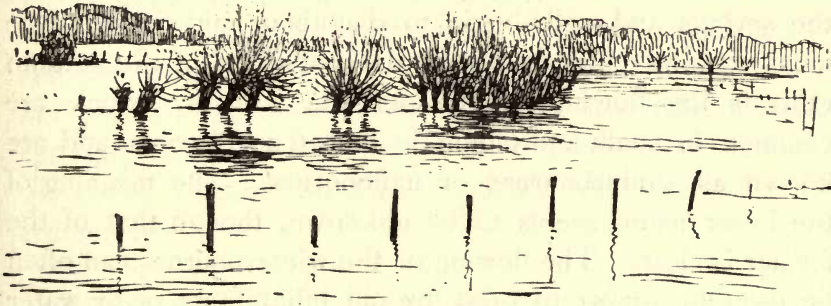
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Shrunken dandelion blossoms gleam from the floor of the stream, and the grey leaves of the silverweed shine where the water has twisted them aslant. In two or three days the decaying vegetation is hardly noticeable; and a fortnight later even its corruption has vanished, and the rivulet is once more lined with clean gravel. Meanwhile, if the wet weather goes on, the whole earth becomes a system of hurrying streams, ramifying from the great navigable rivers to tiny tributaries trickling from the summits of the hills, and even



AUTUMN FLOOD.

from the tops of the trees. Rivulets run down the trunks of the elms and beeches in regular channels; on the smooth beech trunks their courses are traced even in summer by the dark streaks traversing the green. When they reach the earth they sometimes trickle through the wet wood or down the hillside, until they join some runnel leading to a brook; but a large proportion of their moisture sinks directly into the soil. The cracked earth in the beech-wood closes, and the moss grows green again. Deep in the pores of the gravel and interstices of the rock a network of rivulets is forming, like the channels on the surface above. Gradually they penetrate to some impermeable layer, and form buried

reservoirs ; but it is weeks or months before they saturate the thirsty depths of the soil, and produce a visible result in the swelling of the springs. Deep wells and streams fed by springs are often lower in November, or even December, than in August, in spite of six or eight weeks' plentiful rain. The surface water soon runs away when the weather clears ; and though the young wheat springs wholesomely from the moistened soil, the shrunken brooks retain a curious aspect of bygone summer. Minnows still play on the shallow fords, as in the July heats ; and the water-wagtails on autumn passage run daintily on the half-covered gravel.

The autumn rains do not seem to fulfil their promise until the springs and wells begin to rise about midwinter. The most striking example of the delayed effect of the autumn rains is the flowing of the periodic streams, which are common in chalk and mountain limestone districts, and are known as winterbournes or nailbournes. The meaning of the latter name seems to be unknown, though that of the former is clear. The flowing of the winterbournes can often be foretold almost to a day by old inhabitants, or by water engineers ; they usually begin some time in January or February, and run at an even height until early summer. The regularity of their appearance and flow is due to the homogeneous structure of the mass of chalk or limestone out of which they burst. The surface water sinks evenly through vast layers of the porous rock until the level of the accumulated supply rises above one of the vents in an upper valley. Then it starts flowing, and the spring draws an equal volume from the great internal sponge, until the water-level once more falls beneath it. After a long series of dry years, these streams are often quiescent for several seasons. The winter following the extremely wet summer of 1903 was the first in which many winterbournes had run for a long

series of years. The famous 'Jubilee' summer of 1887 introduced a cycle of dry years; and even the rainfall of 1903 was not enough to keep most of the winterbournes running for more than one winter. For the last few years, in spite of some extremely hot and dry summers, we have experienced a cycle of wet years again; even the summer of 1911 did not prevent the whole year being one of almost precisely the average rainfall. The winterbournes have accordingly begun to run more frequently; and they have considerably surprised and inconvenienced people in some parts of England who had forgotten them, or thought they would never return, and had built or laid out gardens in their beds. Long though nature may seem to sleep, she resumes her old rights in the end; and the reappearance of her periodic streams must be looked for with the same certainty in our gentle climate as the repetition of earthquakes or volcanic eruptions in lands where she rules less temperately.



MUSHROOMS

THE least summer-like, if not the most autumnal of all the things that grow, is the strange tribe of mushrooms. About them all hangs a very odour of decay, though in fact the mushroom is a fresh growth of strange vigour. The savour of the charnel-house, consummating the alleged melancholy of autumn, is common to almost every fungus that grows, but the fungus itself rather kills than dies. It is powerful enough to raise great stones, and the activity of the white and stringy strands that serve for roots is not less great than in any spring plant. Some of the mushrooms and toadstools have a peculiar beauty. Artists, especially children's artists, have revelled in the hooded shape, and about a thousand toadstoals gnomes and fairies have danced at night. What a compelling picture is that of the caterpillar smoking his hookah on the mushroom over whose edge the little Alice strains to peep. But the most delicate of all the tribe are seldom found in picture or prose.

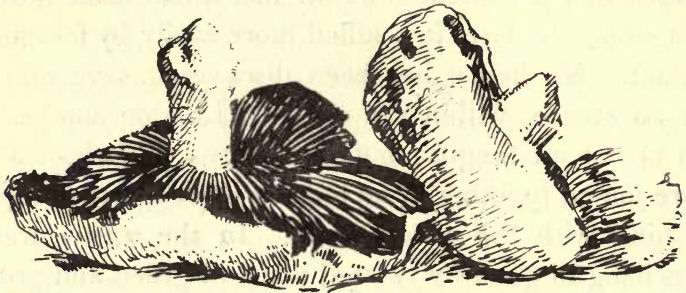
The place for the toadstools is the wood in a wet district. Stools of utter fragility shoot pagoda-like from all the decaying sticks, which they devour and disintegrate. Their peaked heads are streaked with the deepest sepia, like the darker feathers of the woodcock, or sometimes with the most brilliant crimson. The tribe is yet more prevalent than the

eye can observe. The roots of many trees are closely wrapped in fungus; and without the fungus they would scarcely be able to suck nutriment from the soil. The fungus tribe indeed, including bacteria, alone have the power to transmute the soil into food for the plant. The trunks and boughs of the trees in these wetter districts are blue and green with lichens, the most curious of all the things that grow; an old wonder to the botanists. The lichen will stay shrivelled and unmoving for a thousand years, and then wake again, with Rumpelstilzchen vigour, to a new life. It possesses this persistent hold on life, it can suck nutriment from a stone; and yet it is killed more easily by foul air than any plant. No lichen has been discovered, save one small patch on stucco, within the circle of London smoke. The lichen is not all fungus; but half fungus, half alga; and the two are joined together in an inextricable copartnership, each flourishing with the other's help. In the wetter west the lichens hang in quaintly twisted plaits of green and grey and brown, giving every tree and rail a dank and mouldered air, though beautiful withal. In the drier east and within range of a town they dwindle to almost dusty disks. You may tour the better part of Epping Forest and scarcely find an example.

Like small and unpleasant animal parasites each fungus has a close affinity with a particular host, whom, in many cases, it eats out of hearth and home. Watching the tits busy one autumn day along the larch boughs, one notices a twig of needles that have paled before their time. The fungus, which is the ruin of new forests clothing the catchment areas of the Lakes, has begun to take its hold; and the tree is doomed. In happy England no disease rages with extreme virulence; larches may suffer, but they are not wiped out. It is different in America. Within the early years of this

century great chestnut forests have been annihilated by a fungus that was imported—it is thought—in dry timber from Japan. The host in this case could not resist its unwelcome guest for more than two or three years; and you saw masses of the finest trees decay into mouldered ruins helplessly, incurably, while the fine dust of the fungus, like fertilising pollen from an autumn yew-tree, floated leagues wide to spread the malady.

As an English vagrant wanders about the autumn woods he sees signs everywhere of the fungus as disease, but for the



MUSHROOMS

most part it produces rather eccentricities than death. It acts curiously, like the galls and flies, which by a sting can make a leaf grow into a 'pin cushion' on the briar or a round ball on the oak. When the leaves are gone 'the witches' brooms' stand out in black distinctness, like old magpies' nests, on the birch-trees, and similarly on the beeches. This quaint misshapen growth is often, though not in all cases, due to the strands of a fungus sucking nutriment from the live wood. In spite of all the brilliant colours that they may reach, such as the startling scarlet of the Fly Agaric or the Blusher or indeed the pink gills of the common mushroom, the tribe has, to our eyes perhaps, a colour as unwholesome as the smell. We all associate green with health in a plant,

and the distinction of the mushroom is that it is without green, or, for those who prefer Greek, chlorophyll. In the mushroom the green life-blood is, as it were, turned to water, and the complexion is the complexion of a sort of disease. The unpleasantness has found its way into the woods. The fungus is a parasite; and if there are two more unpleasant words in the language than fungus and parasite they are hard to find. Yet the tribe when it reaches the dignity of a separate and manifest plant makes up in form—it may be added in savour—for the wan and unhealthy pallor of some sorts and the advertised poison of others.

Something prevalent in the mushroom and toadstool form fixes it on the memory. What cunning shapes they take: the magpie mushroom folding down over its stem like a



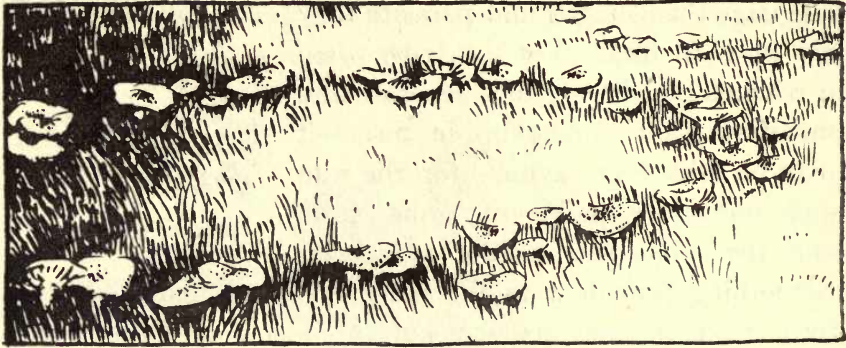
MAGPIE MUSHROOM



DEFLATED PUFF-BALLS

chinese umbrella; the crinkled cushion of the puff-ball; the fluted bracket of the oyster mushroom fixed against an old tree stump: the faery ring, whether of the gross horse mushroom dyeing the grass to a black green, or the pretty Elizabethan frill round the stem of the Dolly Vardon champignon, quaintly tip-tilted; and in spite of the yellow, rather leathery look, curiously attractive. Not least are the hundred dainty forms springing from pine needles or slips of twig in and about the moist woods.

Did ever any plant offer such contrasts in its effect both on us and on things. It may give utter disgust. To quote a passage written one gloomy day after seeing some fungi in their more loathly forms:—‘Hard and loathly forms appear like the spirit of death from rotting trunks; a charnel smell betrays the life-sucking parasites that spring from lively tree roots. As depressing a sight as any that winter brings is the



‘THE FAERY RING’

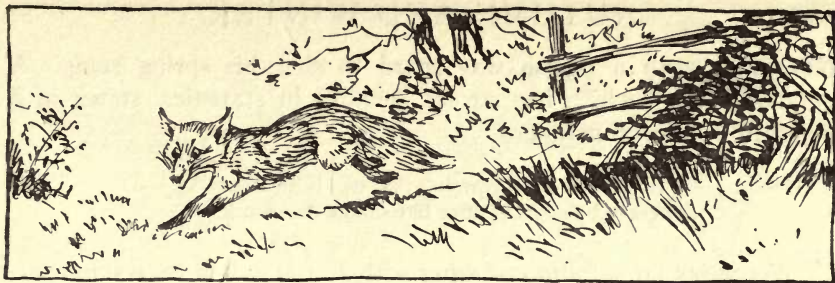
horror of a dead fly glued to a vertical grave by a fungus growth from its own body. The very principle of decay seems illustrated by the mould that comes on damp, neglected things, so impossible does it appear that this same should be a plant sown in the common way by external agents. . . . One fungus is found only on goose’s feathers! Another only on oak leaves, so that the more you study its ways and narrow habits the more the growth still impresses you as an emanation. One springs only from the body of a caterpillar, another lives by catching meal-worms in a spore-noose, specially adapted to the size and habit of the victim.’

But the wanderer in autumn fields or woods could ill spare the fungus. The rings of the coarsest of all the

mushrooms is still a faery ring, and suggests not decay but the elves :

—The nimble elves
That do by moonlight green sour ringlets make
Whereof the ewe bites not ; whose pastime 'tis
To make these midnight mushrooms.

Only—the rings are not sour, but green from excess of the nitrogen which is the master attribute of growth, and which the fungus makes available.



NOVEMBER

' Torn and shattered the trees, their branches again reset,
They trim afresh the fair
Few green and golden leaves withheld from the storm ;
And awhile will be handsome yet.
To-morrow's sun shall caress
Their remnant of loveliness :
To quiet days for a time
Sad autumn, lingering warm,
Shall humour their faded prime.'

ROBERT BRIDGES.

THE COUNTRY CALENDAR

NOVEMBER is perhaps the least distinctive of all the months. You will scarcely find it mentioned in all the *corpus poetarum*. Those who write of autumn prefer October, and those who write of winter begin with December. In the gardener's calendar it is often put down as the first of the gardening months, but it may more properly be called the first of the idle months, varying sharply between autumn and winter. The elms may be leafy, but the chestnuts are bare. Hunting and pheasant-shooting, legal in October, now become active. It is established in statistics that a cold spell, corresponding to the festival of the three ice saints in May, is commonly experienced between November 6th and 12th, and its results are usually to clear the woods and hedges of their relic leaves. There is no better month for observing the heavens; and it is the month of shooting stars.

In that remarkable list of earliest and latest events in natural history, kept for a hundred years by the Marsham family in Norfolk, the first 'indication of spring' is put down to this month. On

November 20th a thrush was heard to sing his spring song. A popular saying, which has strong backing in statistics, states in a delightfully Saxon manner :

'If there's ice in November that can bear a duck,
There'll be nothing after but sludge and muck.'

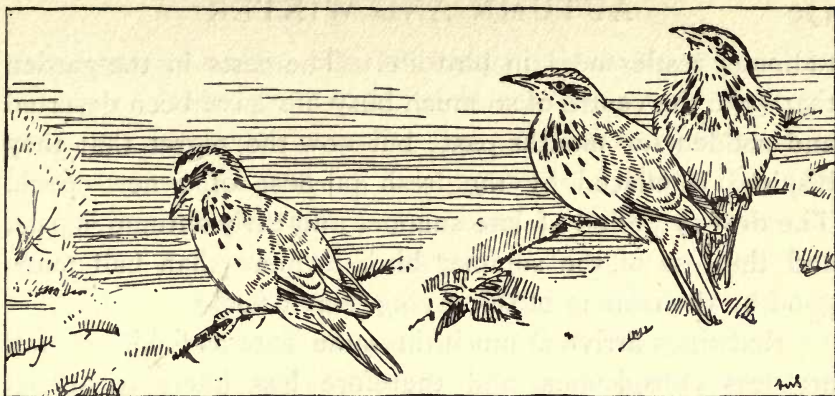
November 1st.—Salmon-fishing with rod and line ceases, indicating a sort of first of spring for fish.

November 11th is Martinmas Day, introducing 'St. Martin's Summer,' a warm period that follows the cold.

Average temperature, 43°.

Average rainfall, 2.27 inches.

On November 1st, sun rises 6.54 a.m. and sets 4.35 p.m.



REDWINGS

WINTER BIRDS OF PASSAGE

To most people in England the arrival of the winter migrants is signalled on some cold clear November morning by the harsh clack of the fieldfare heard overhead. The date of the fieldfare's arrival varies a good deal according to the weather; and the weather in its summer home in Russia and Scandinavia has more influence on its coming than the warmth or coldness of the season in England. But its summer quarters are near enough to our islands to be affected by many of the same changes of wind, and we usually see and hear the fieldfare when the wind has been blowing keenly for twelve or twenty-four hours from the north or north-east, and the morning has been white with rime. Fieldfares are gregarious even in their summer nesting-places in the northern pine forests; and we see them much less seldom in England singly or in small parties than in considerable flocks. When we hear these big thrushes clacking in the tops of the hedgerow elms, or stringing high overhead with their careless, dropping flight, it is one of the great turning-points of the year. Their harsh notes and grey backs tell of winter, with its bare boughs and bracing chills, and its sense of multi-

tudinous restlessness in bird life. The nests in the garden that were the centre of so much busy life have been deserted and sodden for months past; but now the regret that they inspired is effaced by the fresh purpose of a new epoch. The drowsy period of late summer and early autumn is past, and the loss of the summer birds is more than half made good by the coming of the roving winter flocks.

Redwings arrive at much the same date as fieldfares, but are less conspicuous, and therefore less likely to attract immediate attention. The fieldfare resembles the larger and wilder missel-thrush, the redwing the smaller and quieter song-thrush. Both are gregarious birds, but redwings less frequently break up into small parties. Their flocks pass hurriedly overhead with an occasional single piping note and a flight only slightly undulating; fieldfares flit with a loose, flapping flight, rising and falling in careless motion, and constantly uttering their characteristic note 'chak-chak-chak.' Redwings prefer to feed on the open turf of the pastures, where they collect a prey of insects and slugs; but though fieldfares also feed in the grass fields, often mingling with starlings and jackdaws to pick a living, they are fonder of the hawthorn and holly berries. They will descend on a red hawthorn bush in November and keep rising and settling in alternate appetite and alarm in much the same way as smaller parties of missel-thrushes raid the ripe berries of a mountain-ash or garden cotoneaster in October. They can be distinguished from missel-thrushes by the conspicuous slaty patch on the lower part of the back, where the missel-thrush has a patch of pale brown, and by the dark grey wing-feathers, which contrast sharply with the lighter patch. The cries of the two birds are also quite distinct, though manifestly belonging to the same family. The irregular jarring screech or chatter of the missel-thrush is easily dis-

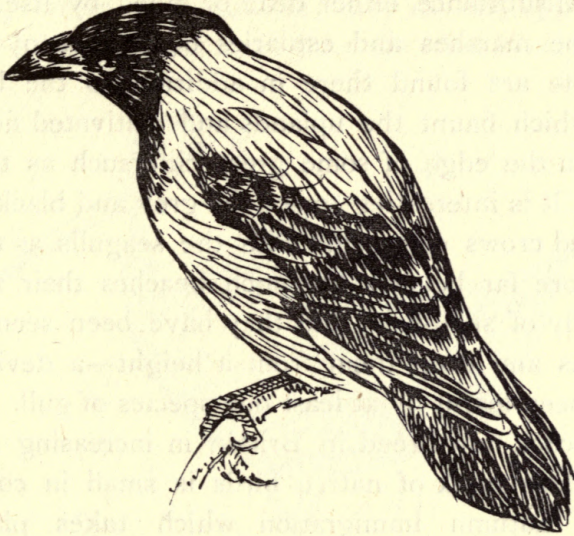
tinguishable from the clearly articulated 'chak-chak' of the fieldfare. Redwings can be most easily distinguished from song-thrushes by their smaller size, plumper, more robin-like build, and by their habit of keeping in flocks. These features are plain at a considerable distance; at close quarters or through a fieldglass, we can tell them by a well-marked pale stripe over the eye, and by the reddish patch on the flank, uncovered by the wing as they fly. They are tenderer birds than fieldfares, nesting in lower and more sheltered woods in Sweden and Norway, and suffering much more severely from hard weather in English winters. In this too they agree with song-thrushes rather than missel-thrushes; the song-thrush also lives chiefly on worms, slugs and insects, which it cannot obtain from frozen soil, while the missel-thrush's diet of berries is available in any weather, so long as it lasts.

Bramblings or mountain-finches migrate from the same regions as redwings and fieldfares; but their visits are much more irregular, and they haunt much more limited areas during the winter. Their great resort is a beech-wood where the ground is well strewn with fallen mast; and in a district where beech-woods abound their flocks can be found in most winters when there has been a good crop of beech-nuts. They are of much the same size and general habits as chaffinches, which also come in flocks to feed on the beech-mast; but they can be distinguished by their conspicuous yellow markings upon the wings, and a pale patch above the tail which catches the eye when they fly. The siskin is a smaller and more beautiful member of the finch tribe, which sometimes appears in winter in parties and flocks, feeding with linnets and chaffinches, or in the large mixed flocks of sparrows, finches and yellowhammers which haunt the ricks and stackyards

in frosty weather. It is a smaller bird than the linnet; and the general effect of bright golden-green in its mottled plumage makes it very noticeable in a flock of various species. Its golden feathers are more evenly distributed about its body than those of the yellowhammer; and it is also much smaller. The crossbill is yet another species of the finch tribe which appears irregularly in Britain from the continental pine-forests in winter. Its visits are exceedingly irregular; sometimes very few crossbills are seen in this country for many winters, and then our island shares in a great migration extending over a large part of Europe, and probably extending to the Siberian forests beyond the Asiatic boundary. The last great migration of this kind took place in 1909, and was repeated to a smaller extent in the following season. Flocks of crossbills were seen wandering in the Alpine valleys as early as July; and a few weeks later the arrival of these fascinating birds was reported from many parts of Britain, as well as from most other parts of Europe. Both crossbills and siskins breed irregularly and in small numbers in this country, and since the 1909 migration, the stock of breeding crossbills has been considerably increased. But the vast majority of the crossbills which have haunted fir and larch woods in recent winters have departed before the spring. In old cock birds the prevailing colour of the plumage is red; but they are greatly outnumbered in most flocks by the hens and young birds, which are chiefly green. Besides this conspicuous colouring, a flock of crossbills is likely to attract notice on the wing by their eager, jerky movement, and a chattering note which seems to correspond to their flight. Their motions are equally restless as they search in the tops of the firs or larches for the cones, which they dissect with their remarkable beaks. The tips of the curved mandibles cross when the beak is closed and

at rest ; when it is open and in action, it serves as a powerful forceps for wrenching open the obliquely inserted scales of a fir-cone, and extracting the seed at their base. Sometimes crossbills feed on haws and other hard seeds like hawfinches or greenfinches.

The arrival of hooded crows in winter is more regular than that of the three birds last named, but is confined more



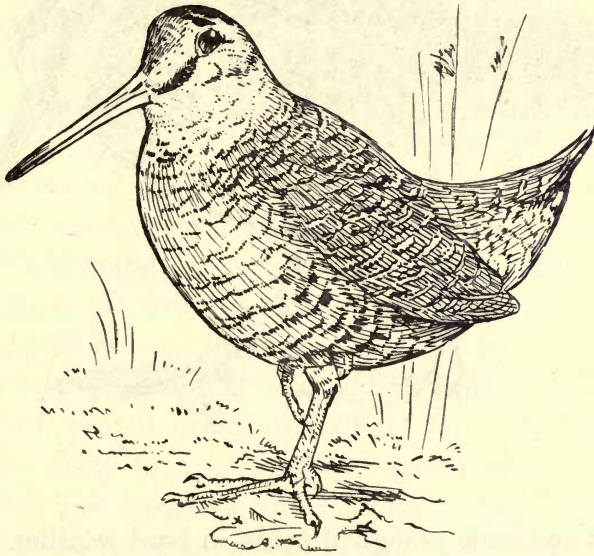
HOODED CROW

strictly to certain districts. Considering how common the hooded crow is each winter in the eastern counties and along a considerable stretch of the south coast, it is remarkable that it is an almost unknown visitor to districts but a few score miles distant. It seems to migrate on a very definite plan which no new influence disturbs. It is scarce in Surrey, though common along the coasts of Kent ; but in autumn a few birds may be seen under the southern slopes of the North Downs, apparently working their way along from the gap of the Medway estuary ; and they reappear

on the return migration in March. In many parts of East Anglia the grey or 'Royston' crow is as familiar in winter as the robin by the kitchen door. But its manners, though equally intelligent, are wavier; it haunts the open country, and particularly the marshes, where it picks up an abundant living on the flats bared by the tide, and along the belts of drift cast up along high-water mark. It will eat almost any animal substance, either dead or killed by itself; and it prefers the marshes and estuaries because many forms of aquatic life are found there in addition to the birds and animals which haunt the uplands and cultivated fields. As one lies on the edge of some great cliff, such as the South Foreland, it is interesting to see the grey and black forms of the hooded crows contrasted with the seagulls as they hunt on the shore far below. On such beaches their food consists chiefly of shell-fish; and they have been seen to carry up cockles and drop them from a height—a device which has also been learnt by at least one species of gull.

Woodcock now breed in Britain in increasing numbers; but our whole stock of native birds is small in comparison with the autumn immigration which takes place from Scandinavia. The great rush takes place between the middle of October and the middle of November; and it is expected at the time of the full moon, which is believed to be chosen by the woodcock for their passage by night. The movements of woodcock in this country form a very interesting chapter in the history of migration, and one which is still imperfectly understood. The general body of evidence tends to show that the migrations of this species oscillate along a path running from Scandinavia and northern Russia on the north-east, south-westwards through our island to western France, Spain and Portugal. The last point at which they rest in our islands is the south-west of Ireland; there they

collect in large numbers, and often provide excellent sport. It is chiefly a matter of the weather whether they collect in large numbers at this or any other point in their path; cold weather sends them on, and mild weather attracts them to unfrozen feeding-grounds in the woods and mires. Most of our own breeding birds seem to begin to move southwards about the end of August. But the date and extent of their wanderings seem very variable; they do not appear to be guided by strict rule any more than the other species nesting

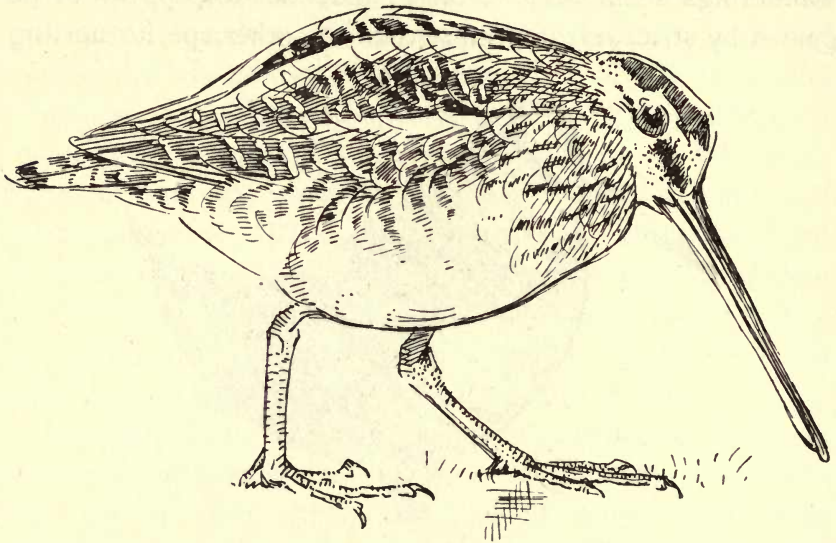


WOODCOCK

with us which are noted in the chapter on the Departure of Birds. Woodcock are regarded as immigrants in winter, not emigrants, because the majority of the species nest more to northwards, and move down at this time; but they provide an excellent example of the way in which the same birds may have a different classification in different parts of their range, and the same species may be represented in any one

district from month to month by birds with a very different history.

The same is true of snipe ; they nest in many parts of the country, but the numbers of winter visitors are far greater than those of the nesting birds. The jack snipe is a winter visitor pure and simple ; it breeds in Lapland and the Arctic tundras, and departs again in March. Golden plover appear



SNIPE

on heaths and wide ploughed fields in hard weather, flocking down from the Baltic and Arctic basins where they chiefly breed. Some of them may possibly come from nesting-places on the mountains and high moors of the northern counties and Scotland ; but probably most of our own birds go southward early, in the vanguard of the movement. On the sea-shore and in oozy estuaries, as early as August, flocks of dunlin are once more veering over the creeks and channels, showing their gleaming bellies as they turn. Curlew come down from their high-lying inland nesting-grounds at the

same time; and they are joined by wandering whimbrels and redshanks and oyster-catchers. As autumn goes on, a greater variety of waders flocks down from the high north. Some of them, like the ruff and the black-tailed godwit, once nested in the English fens, and still breed not far away in Holland and the Baltic basin. Others, like the grey plover and sanderling and knot, are migrants from the swamps that fringe the Arctic sea, and their nests have seldom been seen. Most of these visitors from afar fare still further, and are seen no more after the season of autumn migration; but some remain to add interest to winter walks and watchings.

With the woodcock at the end of October comes the 'woodcock owl.' The short-eared owl is widely known by this name among sportsmen, because it not only arrives at the same time as the woodcock, but is flushed in the same wet woods and thickets where woodcock lie. The owl has the same accidental connection with the woodcock that the cuckoo's mate, or wryneck, has with the cuckoo. It is the least nocturnal of owls in Britain, except the recently introduced little owl, which is now quickly spreading; and its greyish-buff form is often seen flying low towards twilight over some rushy field or tract of sedgy marsh in quest of field-mice. The barn-owl also flies occasionally before it is yet dark on an autumn or winter afternoon; but it is paler and brighter in colour, as well as being a little smaller. As is the case with the woodcock, the short-eared owl normally nests in Britain in numbers small in comparison with its winter flights. But the enormous multiplication of breeding birds in the districts of the Scottish lowlands affected by the great vole plague of 1893 will long be remembered. The short-eared owls gathered in great numbers to prey on the swarms of voles, and a great number remained to nest in spring. Waxing fat on the unlimited diet, they began to

breed very early in spring—some time before the ground was clear of snow—and laid double the usual number of eggs. The concentration of so many owls on this one district is an indication of the great numbers of birds which normally traverse any area during their winter wanderings, and depart unnoticed. Every short-eared owl which came to this land of plenty stayed there ; and the consequent abundance of the species seemed unaccountable and almost miraculous.

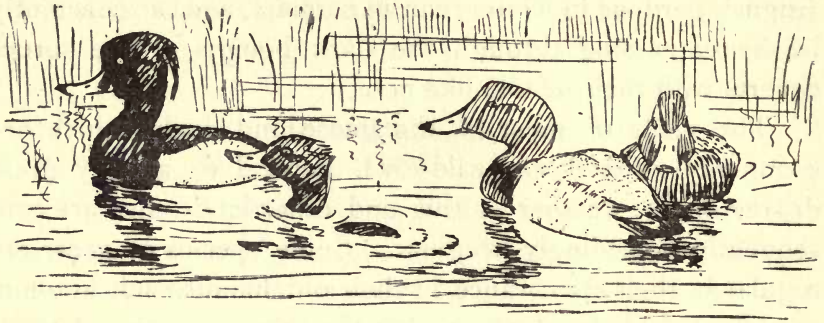
Besides short-eared owls, the vole-ridden sheep-farms were visited on that occasion by large numbers of rough-legged buzzards. This fine bird of prey, with its legs feathered right to the toes, is a regular winter visitor in small numbers from the uplands of Norway where it breeds among the crags. Usually it is a rare bird, and many years may pass without its being noticed in a locality ; but the abundance of voles collected the rough-legged buzzards from a wide area—possibly from the greater part of their whole winter range. Normally it lives a wandering life during the winter, chiefly haunting hill ranges and open downs. It is one of the most typical winter visitors, though not a common one.

Every rough-legged buzzard identified in Britain is easily recognised as a visitor from abroad, because the cases of its breeding here are so rare as to be negligible ; but there is no such easy criterion in the case of some other birds of prey, such as the sparrow-hawk and kestrel, or of the great flocks of diverse species which they accompany and prey upon. The winter visitors to Britain include vast numbers of skylarks, chaffinches, goldcrests, rooks, crows, plovers, wood-pigeons and many other species which are included among our breeding birds ; and the wanderers from one English county are winter visitors when they appear in the next. There can be no doubt about birds of common English species being visitors when they are seen landing, or passing

the lightships and lighthouses, as is often the case. Goldcrests arrive in autumn in great numbers from the pine-forests of Scandinavia; the passage of this minute and short-winged bird over the stormy breadth of the North Sea at the roughest period of the year is one of the most striking features of migration. Soon they spread themselves over the country, haunting fir-woods and the shelter of evergreens in gardens; they are far more abundant in many English gardens in winter than in summer, and can constantly be heard passing through the dark boughs of the spruce coverts with their needle-like cry.

The visits of most of the geese and ducks which are commonly classed as 'wild-fowl,' depend to a very great degree on the weather in this and other lands, and are consequently exceedingly irregular. Some species of geese are regular in their appearance in their old haunts each autumn, though variable in numbers; but the great majority of these water-fowl come to us when the frost of a severe winter has gripped their oozy feeding-grounds in the Baltic basin and along the eastern shores of the North Sea, and their coming depends on the season. Their numbers have greatly decreased, since reclamation of marshes and harbours has diminished their feeding-grounds, and their chief haunts are more closely watched by gunners. Next to the well-known mallard—often called the wild duck to the exclusion of all the other species in this fine group—the commonest species of duck which visit us in winter are wigeon and teal. The wigeon keeps chiefly to the estuaries, though it sometimes visits inland lakes; but the brilliant little teal distributes itself well about the country, settling down on small woodland ponds as well as larger sheets of water. Pochard are scarcer than teal and wigeon, but are seen fairly often on inland sheets of water in hard winters. Though they belong,

like the wigeon, to the group of diving ducks, their natural haunt is on fresh water, and not in the estuaries. Tufted duck are becoming more common as a nesting species in many counties, and more familiar as winter visitors where they do not yet breed. With their bold pied markings of black and white, bright yellow eye, and hanging crest, the drakes are very handsome birds, and catch the eye from afar as they rest on the water or dive. The ducks have the same general



TUFTED DUCK AND POCHARD

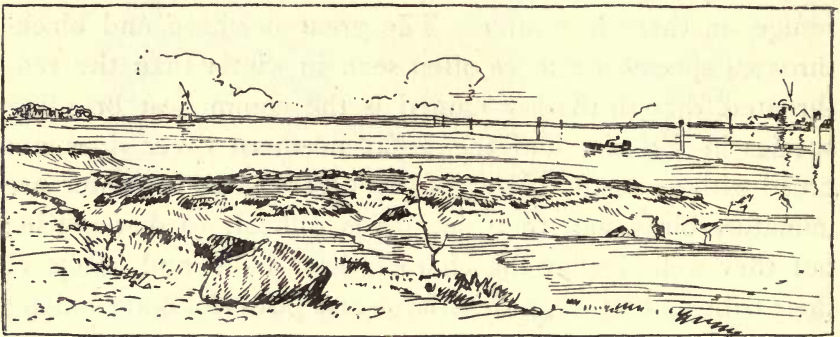
pattern, but the black and white patches are replaced by two shades of brown, so that they are much less conspicuous.

All these species belong either to inland waters or to creeks and harbours; the true sea-ducks haunt open salt water, and scatter round the coasts in winter with the divers and guillemots and gulls. The commonest of them is the common scoter, or 'black duck,' which can often be seen near the coast, as well as occasionally inland, when it has been carried out of its course by stormy weather. Even during the hour's crossing on the frequented route from Dover to Calais, scoters can often be seen; they fly low over the water like smaller cormorants, or float low in the trough of the waves. Gannets are also frequently seen in winter in the straits of Dover, as well as round the rest of our coast; as autumn approaches, they wander from their densely packed

breeding-places—chiefly off the Scottish coast—and live a roving sea-life till spring. Guillemots, razorbills, and puffins rove off the coasts through winter in the same way; and the little auks join them from their far northern breeding-places within the Arctic circle. True sea-birds, none of them willingly approach the shore; but we see them cast up dead on the beach after long spells of stormy weather, and they are sometimes picked up far inland, when gales and thick weather have confused and beaten them from their course. Divers are more often seen close inshore, as well as out at sea; they nest in fresh-water lakes, and sometimes take refuge on them in winter. The great northern and black-throated species are more often seen in winter than the red-throated, though the last-named is the commonest breeding species in Britain, and the great northern diver does not breed with us at all. Most of the divers seen in winter are immature birds, and their species is difficult to distinguish; but they well display the characteristic build and habits of their tribe as they urge their large and powerful bodies along the sea, disappear for a long dive, and rise with long neck and bill uplifted many yards distant from the point where they disappeared.

A peculiar view of migration is opened to observers on the east coast of England. It is generally supposed that a south-east wind sees the greatest movement, although birds flitting from north-eastern Europe would appear to prefer a slanting wind. Often there is a dreary undirected drizzle prevailing, a condition of weather by no means to their liking or benefit. They often tire and lag on their journey; many drop into the sea to perish, and others bewildered, like mariners on an uncharted coast, drop wearily on ships, or strike the lanterns of light-vessels, to be picked up in dozens

in the morning by the lightsmen, dead or maimed. Black-birds, starlings, redwings, crows, rooks, and many others are found by the score, and not infrequently by the hundred. In widely extended flocks, like baffled skirmishers, they beat jadedly in. Lapwings also almost invariably arrive abreast of the wind, often so utterly fatigued as to drop down in the first sandy wheel-rut that offers, or behind the nearest stone that affords a little shelter. They are then so tame and tired that they may be picked up. A lady one day thus caught a way-worn linnet, placing it in the bosom of her



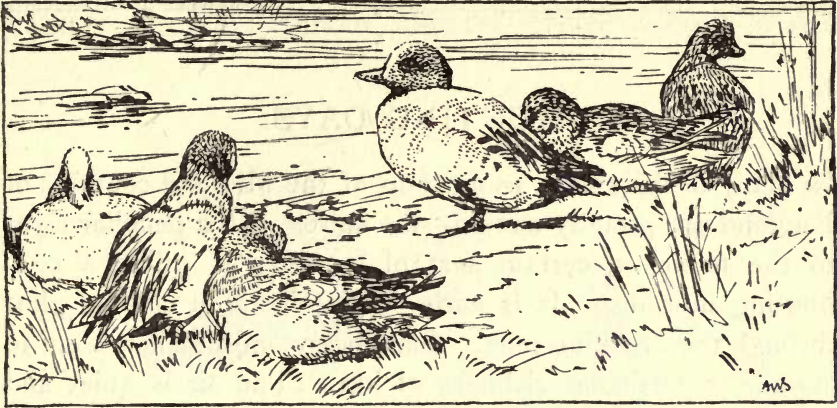
BREYDON

jacket: when the warmth had revived it, it struggled out and took to wing.

Some of the great salt-water broads—of which Breydon is the chief—have been known as great tidal resorts of numerous species of wild-fowl.

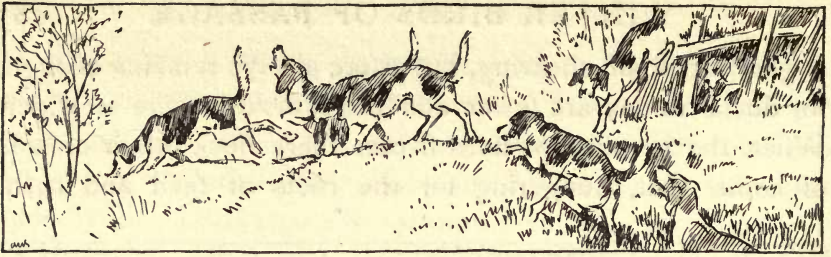
In stirring autumn and in severer winter many travellers drop in, breaking the southward journey, some driven, maybe, against their will, by the keen frosts of winter, from Scottish lochs and Scandinavian fjords. In the shallows, the wigeon pulls at the long-stemmed *zostera* or 'grass,' and deftly breaks in pieces the succulent stem; the mallard and his kin bite the greener fronds into short lengths, and between them they do

a good spell of shearing, but there always remains enough, for ducks to-day are fewer and the *zostera's* range is wider. When the broads are hard frozen there flock hither crowds of coots, that, hungering for the roots of reed and rush,



WIGEON

remember that last year they found a friendly substitute in the luscious 'wrack.' And they fly to the broad, feeding like sheep on the grass that lies prone when the tide is out, and wander about upon the soft ooze, all heading one way, like grazing cattle.



HUNTING DAYS

IN many of the shires, as a group of the Midland counties of England are proudly named—the shires with a peculiar right to the name—a certain sort of morning is called a cub-hunting morning. It is early. Rich autumn colours glint through the breaking mist. Blackberry and bracken seem to assume a particular richness of hue. The air is quiet and odorous; and as you stand by the covert-side the baying of the young hounds—‘matched in mouth like bells’—seems scarcely a disturbance of the scene. But the hunt is up; and to that everything surrenders. In the rides and outside the covert the few mounted men clap their riding-whips on the saddle-flaps to keep the cubs in a particular quarter. The hour of observation is over. Just now the live things, cubs and others, would come close up almost to your feet; and you would see them quietly exercising their watchful and furtive gifts. Of the wild animals that England boasts—and they are not many—the cub is the most delightful to watch; and the grown cub, many hold, the only one worth hunting. The hunt may almost be said to be a part of the scenery in rural England and Ireland. The floor of lanes and rides and droves are pitted throughout the year with the hooves of the hunters. The bay of the hounds is the most musical of sounds; the restless sterns of the pack were once compared by an enthusiastic master with the swaying heads of the

reeds in a wind. The flaming pink of huntsmen, whip and *habitué*, is an attraction to draw every countryman, even the persistent labourer, from his work. A politician on an Irish tour not long since offered a country driver two pounds to catch a certain train; but as he offered it the horn of the Galway hunt rang over the moor, and the driver refused to stir.



FOX CUBS AT PLAY

Villagers of all ranks proudly 'walk' the puppies, so sharing in a sport vicariously democratic, though aristocratic enough in equipment.

All hunting is autumn and winter sport; but it fills more than half the year. Cub-hunting begins in September, and there are those who boast of killing a May fox. It fills too much of the year. Beagles and harriers hunt many a hare that is heavy with young; and this is an inhumanity that no sportsman can face with equanimity. The May fox is now

seldom killed, though out on the rougher moorlands the ambition to kill him still holds.

'Cubbing,' the most democratic form of the sport in one way, because it may be followed on foot, is one of the few sports which compels an early start. How many of us owe our knowledge of early morning hours to the news, never published, but breathed quietly to a few residents, that hounds will be at such-and-such woods at five-thirty on such-and-such days. People as a rule begin shooting at a late



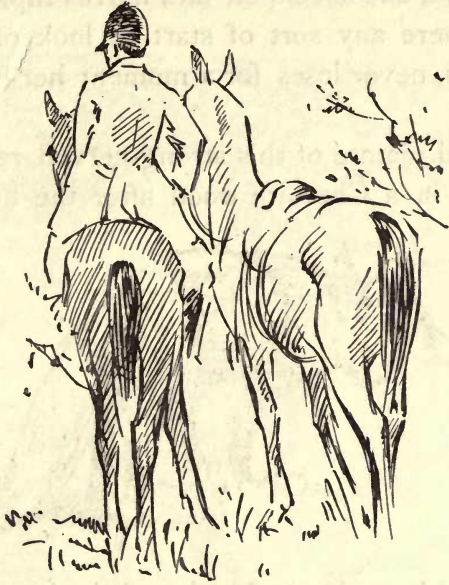
THE RUNNER AND HIS DOG

hour, though they would be wiser to imitate the cub-hunters. There are no hours in the year to equal the early autumn hours; and a wood is the place to enjoy them, cubs or no cubs. As hunting, the training of the young hounds in the pursuing of cubs is not a grand sport, and it may be brutal. No sporting experience is more appalling than the digging out of the cub from an earth; but one hopes that the fighting savagery of the animal overcomes fear; and it seems so. Many a cub, whom we watch in earlier months playing with the rest of the litter, will a little later reach an ecstasy of the fighting spirit in which he will attack anything. One has seen the cub thrust his head out of the earth, and in face of the ring of hounds and men and

DIANA OF THE UPLANDS
By CHARLES WELLINGTON FURSE, A.R.A



children close his jaws on the metal of the draining spade, even while the terrier was fastening on to him in the rear. The rush of the hounds, overwhelming cub and terrier (who runs a greater risk outside than in), is frankly terrible, as the

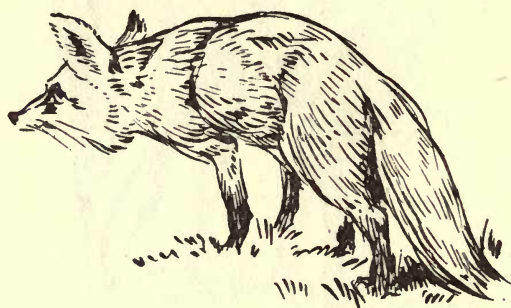


hunt of a grown fox in the open never is. But the litters must be reduced. In every hunt the poultry money comes to a considerable sum ; and though it is a humorous reproach against farmers that they prefer to have their chickens killed, the havoc is often pitiable. When one has once seen a houseful of hens killed and mauled by a fox one realises that this splendid beast is vermin nevertheless, and deserves the generic name. Nature is 'red in tooth and claw.'

If you would see the fox at his best or in most characteristic guise, wait by the side of the covert till the hunt is gone. Within a very short while the old vixens return. If you know their ways you may come thus within a few yards of them. Light-footed and wary she will slip back along the

hedgerow, looking this way and that and listening. She will stop and stare greedily at the grown lambs which huddle away in a sort of inquisitive alarm. When the vixen comes quite close to you, as you wait by the gap peering at her, and becomes aware, she sheers off and moves rapidly ; but at no moment is there any sort of start or look of alarm. She never scurries, never loses for a moment her full presence of mind.

A splendid picture of this strong-nerved readiness of the fox was seen in a Cheshire wood after the hunt was gone.



The wood had been drawn blank and the keeper's pride was touched. The hunt would certainly say that he trapped or shot his foxes, a crime still regarded as among the most heinous. So the keeper, with a stopper of earths, entered the woods and led the way to a great sloping tree. Snug and almost hidden in an axil of the branches lay a watchful vixen. She was stirred out of her lair ; and seeing her only alternative, took it with great deliberation. Quite slowly and steadily, looking at the watchers on this side and that, she stalked down the trunk, taking in, one would say, every detail of the scene. Then, within a yard or two of the ground, she jumped down and slipped off with wonderful noiselessness on velvet foot through the undergrowth. She might have stood for a likeness of the Happy Warrior.

If in any animal instinct has developed into a form of reason, it is in the fox. A Welsh observer has given some evidence that the dog-fox will on occasion drive the game to the vixen; but whether or not this is so, almost all their actions show notable deliberation, give the suggestion that



the action whatever it may be is thought out. This holds through the chase till the point of death. Foxes realise the danger of their own scent. A hard pressed fox has been seen to roll itself well over in a heap of manure. He frequently runs through a drain or takes to water, or attempts to confuse the trail among a flock of sheep.

The hunting months of the year may be said to be four. The summer-time is ended with the first cub-hunt, at five

o'clock some September morning. Many a hunting man has enjoyed a stolen run in October ; but the first real runs are in November. No rural science is more characteristic of England than these opening days. The hounds are an English dog bred through many generations to present perfection. Even in Canadian county clubs, where the drag is a popular pursuit, the huntsmen boast of the Fitzwilliam or the Belvoir blood in their packs. The horses are hunters



such as you will not see out of England, for in no other country is there the thoroughbred strain from which to breed them. The little woods—the gorses, the groves, the wolds, the spinneys—which they will draw, the trim hedgerows round the fields across which they will run, the quiet eagerness of the men and women, the spruce grooms on second horses, the unquestioned leadership of the huntsman and deference of the hunt, the fine Saxon names of the hounds, drilled into obedience matching the rest of the hunt, by the cheery voice of the whip—all this and a hundred more details of the meet will remain pictured on the mind of the countryman as if they made up the season not less than the last leaves fluttering

from the elms or 'Huntingdonshire Oaks,' as they are known in the Fitzwilliam country.

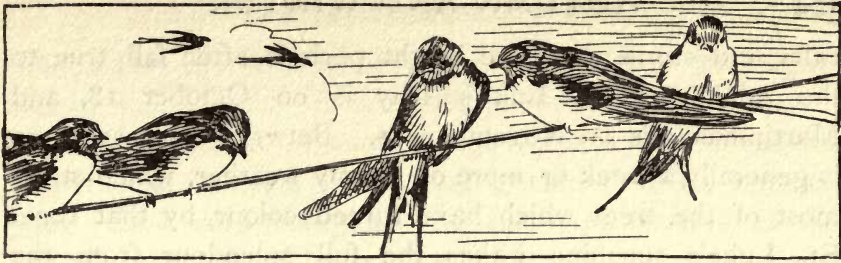
Among the favourite reminiscences of hunting men is the record of Mr. Parry's last verdict. Towards the close of his life he was asked what he most regretted in his past life, what in especial he would do differently if he had his life again. His answer came pat. 'I should hunt,' he said, 'a great deal more before Christmas.' Nine years out of ten, the season is open up to Christmas. Snow and binding frost are rare. 'The southerly winds and the cloudy sky' that the hunting man longs for are frequent. The 'going' is soft. The very wind suggests a ride; and in the bared hedgerows is no symptoms of budding green, in the woods is no sound of spring song to suggest that the truce between hunter and hunted is approaching.

Yet February is usually regarded as the hunting month of months, though frost is common and pairing has begun. But the middle of the season is the truer zenith. The contrary theory has prevailed, principally because shooting ends on February 2nd, and hunting remains the sole sport in the shires. December may be taken as the summit of the season; and the best days that most hunting men recall are those when they rode back in the dusk and the tea hour was not passed when they reached home.

The cardinal mystery of hunting is the scent. The wisest cannot be sure when scent will lie and when it will not. It is held by some that a blue fog on the horizon tells of a bad scent. A very heavy wind is certainly against scent. Extremes of dry as extremes of wet are against it. But all their rules are broken. Mr. Scarth Dixon, in a charming little book on *The Hunting Year*, records the fastest runs he remembers as coming in March; and adds he has never enjoyed an exceptional run in January. It is not

unlikely that different foxes leave scent of very different power, certainly the vixen, like other mothering animals, leaves a very faint scent in spring. Perhaps the one thing that can be said with certainty is that scent is better under a low barometer than a high; and the barometer is never lower than when the wind blows heavy clouds towards the north-east. The hunting-poet had therefore full justification for his ideal of a 'southerly wind and a cloudy sky.' Such a wind is an insurance against frost unless the clouds are level and very high—it has enough moisture to make that most perfect of all organs attain its most sensitive pitch, and the air holds the vibrations or infinitesimal particles—whatever they be—that instruct the nose of the hound as the ethereal vibrations the eye of the eagle.





OUR INDIAN SUMMER

BETWEEN the roaring gales of autumn there is usually some calm interval of exhausted violence when the sun shines bright from a limpid sky, and summer almost seems to have returned. Though most of the summer flowers have vanished, and some of the trees are already bare, the colours of the autumn foliage fill the landscape with redoubled splendour, and make this season the most brilliant of the year. In America this period of calm dry weather after the early autumn storms is longer and more regular than usually in England; and the oaks and maples in that dry climate burn with a fiercer brilliance than in our own mild air. There this halcyon season is known as the Indian summer, because it was formerly the great hunting-time when the Indians and the settlers who followed them gathered most of their year's harvest of furs and game. The name carries a suggestion both of the forest peoples and of the forest landscapes, which flame into pre-eminence after the cultivated fields are stripped bare; and it is conveniently used in England for the whole season of late autumn sunshine and brilliant boughs, when the woods are at their richest.

According to the older reckoning, St. Luke's summer falls in October, and is followed by St. Martin's little summer, when the November sunshine lights up the golden elms. Our autumns are generally broken into alternate periods of

calm and storm ; and the bright periods often fall true to the calendar. St. Luke's Day is on October 18, and Martinmas falls on November 11. Between the two there is generally a week or more of stormy weather, which strips most of the trees which have turned colour by that time. St. Luke's sunshine wakes the full splendour from the beeches, which have a greater wealth and diversity of colour than any other British tree. It falls on the autumn bracken at its richest, and on the gold and purple of the lingering furze and heather. By Martinmas the beeches are bare, the bracken is down-beaten, the furze and heather have grown dim. But the elms which were still almost green in mid-October have changed to their frail but splendid gold ; and a deeper russet begins to smoulder in the tops of the oaks. The landscapes of the two little summers show a contrast that is only possible at the swiftest turning-points of the year. Nature sinks far towards winter between the days when the last swallow greets St. Luke and the Martinmas morning when the fieldfare clacks overhead as the white fog clears. But both of these little summers are filled with calm sunshine, and a sense of a summer day-dream still lingering to enchant the land.

On an average of a series of years the features of these two summerlike seasons are very constant ; but part of their attraction is the way in which they vary from year to year. In 1911 the glorious October weather added the flowers of summer and almost the growth of spring to the unchanged verdure of the beech-woods ; and many house-martins delayed their departure until November. The first snow seldom lies in a green landscape ; but St. Martin's summer may open with the oaks' crowns still green, and rising above the white sheet spread on the fields. Then the sun shines day after day, and the earth forgets its vision of winter. By St.

Luke's Day the autumn harvest of berries is at its height; but in some seasons it is combined with a rich display of lingering flowers. Beautiful and unusual posies can be gathered of crimson rowan and guelder berries, mingled with yellow corn marigold, and the dark clusters of the privet contrasted with sky-blue chicory flowers. Mayweed and poppy still brighten the corn and root fields, harebells and blue campanulas mix with the gorse and heather on



GUELDER-BERRIES

downs and commons, and honeysuckle and sprays of fox-glove lurk in the thinning copses. But the brightness both of berry and blossom is overwhelmed by the splendour of the autumn foliage. The boughs in the beech-woods range through every shade of red and yellow, from pale buff and ivory to richest orange and crimson. The colour of the rain-washed bark blends with that of the leaves and produces a rich tint of purple. Where a great beech-wood burns to the blue October sky in ridge beyond flaming ridge it almost awes the mind by its vastness; but the effect is hardly less striking where a single coloured spray lights up some woodland avenue. In garden alleys and dark paths by streams,

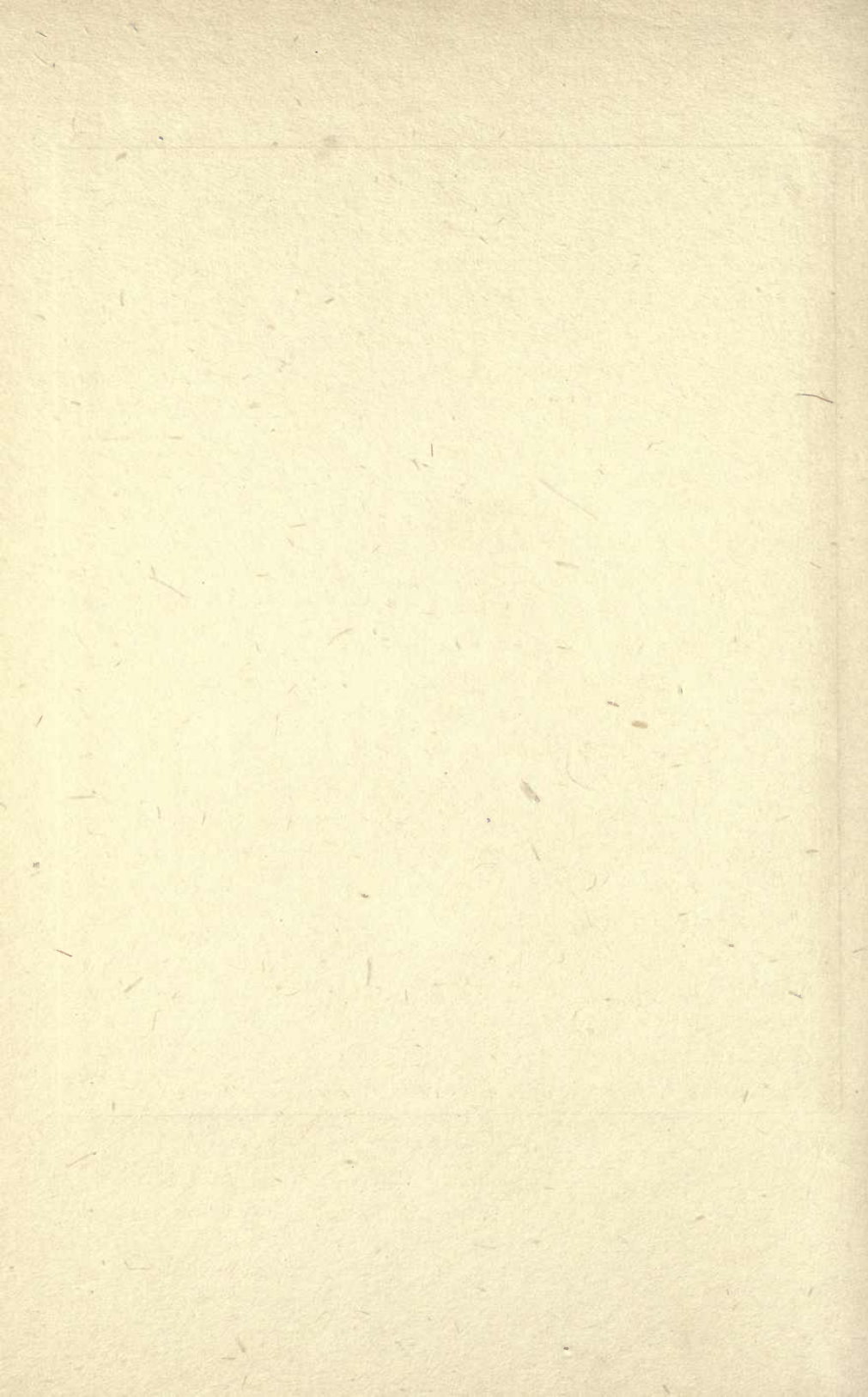
where the dull bronzed foliage hung heavily all through July and August and September, now a branch of elder or sycamore stands like a blown torch across the track, and makes the whole place beautiful. Through the thinning woods the gold and amber of the bracken bathe the hill; red leaves come floating down the freshened stream, where crimson berries hang towards the red-spotted trout. The colour seems intenser for the prevailing silence; the last curlew's cry is gone from the moors, and the birds are subdued in the garden. There would be something almost sinister in this squandering of all spring's verdure in splendid ruin, if we did not feel through all the riot and waste the year's quiet march to spring again.

Silent as are these brilliant October days, when we compare them, as they seem to invite us, with the other season of bright colour in spring, they are not without their song. Compared with the dead season of August, October is a musical time. The robins are in fine singing courage, as if every red leaf mocked them with the suggestion of a rival. They have nearly finished the sharp contests for autumn and winter quarters which begin after the summer moult; but still they chase one another about the walks, and the conqueror mounts in triumph to utter his pæan. There is no instinct of melancholy in the robin's autumn song, as the occasions on which it is uttered sufficiently testify. The poets have looked into their own hearts and not into his when they represent him as mourning for summer's decay. At all times the clear sweetness of the robin's song has a touch of plaintiveness to our ears; even in spring this is very noticeable when the robin is heard just after a gay singer like the chaffinch. As far as it is possible to compare them, the robin's autumn song has not quite the cheerful vigour of its March or April notes, but this is simply due to

CUTTING GORSE

By HARRY BECKER





the fact that it has not reached the full physical vitality of the mating season. The song-thrushes are only just beginning to recover their songs in October; they utter a scranrel piping from the elm boughs, on the soft wet afternoons that seem most to encourage them with a suggestion of spring. A rare but characteristic October singer is the woodlark, which can be heard pouring out its singularly rich and skilful song from a tree-top or telegraph wire. A few bright insects of true summer are still active in these October days and nights, though most have sunk to sleep. Red admiral and small tortoiseshell butterflies linger in warm corners on the ivy-bloom, and small coppers flicker among the gorse, and settle on the last hawkweed blooms on the common. In the calm and unchilled nights the glow-worm shines by the roadside with a pale greenish light. Her lamp changes with the warmth of the season; in the hottest weeks of July it burns almost as red as the end of a cigar.

A great change is wrought



SMALL COPPERS SETTLE ON THE
LAST HAWKWEED

by the next spell of stormy weather, and St. Martin's summer shines on a barer world. The mornings are heavy with white mist, through which the heavier leaves pat the earth as they are loosened by the rising temperature after the night's frost. As the pale blue sky appears through the melting mist overhead, the crowns of the elms stand out in masses of gold and amber and smoky yellow. Though the range of colour is much narrower than in the beeches three weeks earlier, the increased simplicity of this Martinmas display only adds to its effect. It is in accordance with the whole spirit of the time, when summer stands on the thinnest of platforms separating it from the dark gulf beneath, and yet never looks more fair. The mist clings all day to the remoter distances in an almost invisible film, and dwells transparently even in the hollows among the upper boughs of the elms. We feel that all this beauty hangs by a tenure as frail as the mist, and that it will be destroyed by a single night of storm. The finest of all the pictures formed by the elms at this time is where they stand massed round one of the large black red-tiled barns which are common under the flanks of the chalk hill-ranges. Elms grow to a great height and volume of foliage on the first belt of loam under the chalk-hills, and dominate the open landscape. Their golden boughs make a magnificent contrast of colour with the long red roof and black sides of the wooden barns; and there are just those minor repetitions of colour which bring out the force of a general contrast most picturesquely. All the year round a crust of yellow and orange lichen mottles the tiles; but now it falls into a new harmony with the boughs above, and with the leaves that drift upon the roof. The sooty spots that fleck the yellow elm-leaves answer in the same way to the barn's black timbers below. Every feature of the English countryside

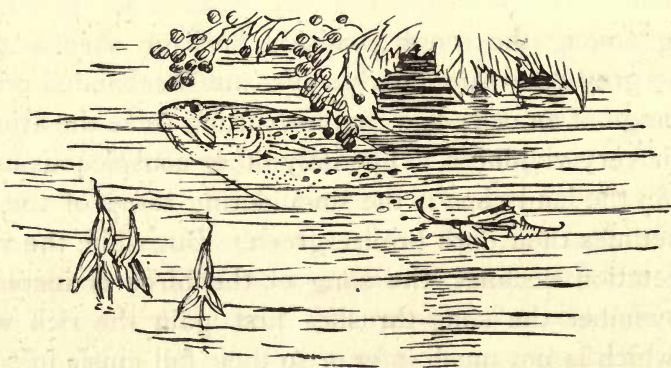
has its one perfect season ; and the time to see these old timber barns is when the elms turn yellow. The few flowers that linger in the November landscapes are too faded and scanty to hold their own against the brilliance of the foliage and the delicacy of the pale blue sky. The eye overlooks them as it catches the broad outlines of the elm-tops and the pale haze clinging to every horizon. Masses of thistle-down



THE TALL ELMS AROUND THE BARN

drifting among the rough roadside herbage shed a gleam like the grey dews and pearly sky ; and the banded crimson and orange of an osier-bed ripe for cutting seize the attention by their very vividness. The only other conspicuous note of colour in the landscape is the smouldering russet of the oaks, or sometimes their dark bronze-green. But while the vigour of vegetation declines, the song of the birds is increasing. In November the song-thrushes first gain the rich winter song, which is not much inferior to their full music in spring. Often they sing from among the elm boughs ; and the con-

centration of colour and song shows St. Martin's summer at its richest. Starlings flute and chatter among the trees and on the house-tops all through the sunny days ; and on calm mornings, when there is a promise of a fine day to follow, we can hear them beginning their broken monologues outside our windows before dawn. Robins utter sudden bursts of song in the dark hollows of the shrubbery where the rotting leaves give out a smell of mould ; they will haunt those dark bowers until they nest in them again in spring. It is these songs of the birds which carry the mind forward beyond the frail brightness of St. Martin's summer to the spring which its falling leaves prepare. There is a sense of respite in the sunshine and golden boughs that is all the keener because we know there is no exemption. Winter may come suddenly in a night, and all the elm boughs be bared by the gale, or by the gentle morning wind after a frost and fog. But to the thrushes it is almost spring already ; they have felt it for a full month past, and will hardly cease proclaiming it all through the shortest days. While the mists and golden leaves of St. Martin's summer speak of imminent decay, its birds foretell life's renewal.



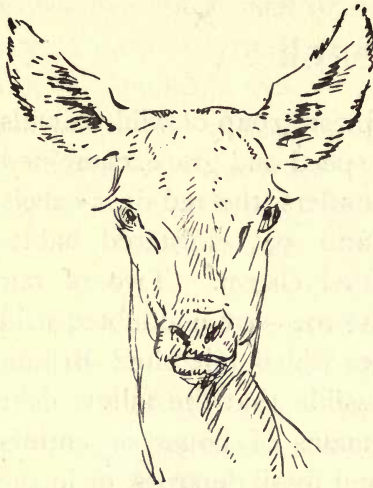


BRITISH DEER

OUR three kinds of deer are the finest group of wild animals now surviving in our islands. In speed and grace, combined with the noble appearance of its antlers, the red deer excels all our other beasts; its wild and yet cloistered habits and fine instincts give it an added charm. Two of our three species—the red deer and the roe—are undoubted wild animals, descended from the races which inhabited Britain in far prehistoric times. It is possible that the fallow deer may be the same. Since no remains of bones or antlers have ever been found in the recent fossil deposits, or in the peat-beds, it is generally believed that the present stock of fallow deer in our parks and forests were introduced in Roman times, like the pheasant. But remains of the fallow deer are not lacking from the older fossil layers, where they occur with those of the red deer and the roe. It is strange that this one species should have vanished, while the other two survived: and it is possible that further search in the peat-beds will yet discover traces of the existence of the fallow deer in early historic times, and link up the present stock with the primeval dwellers in the land.

The red deer is a thoroughly characteristic animal of the great forest belt which runs right round the world in north temperate climes. Its representative in America is the

wapiti; and in Asia, South and East Europe, and North Africa, there are numerous races and varieties of red deer which do not deserve the name of separate species. The branching form of the antlers has been moulded by development among the like patterns of the forest boughs. Nowadays it may seem strange to speak of the red deer as a typical forest beast; we are more accustomed to see it amid



HIND OF RED DEER

the more or less bare moorland and mountain scenery of a Scotch deer-forest. But it is chiefly confined in Scotland to open country, because no room can be found for large beasts of wandering habits and hearty appetites on the lower, more wooded and more fertile ground. The red deer has been expelled to the lonelier uplands, like the raven among fowl. But there are miles of dense thicket as well as open

moor in its haunts on Exmoor; and the same is true of the New Forest, where a very few red deer still survive. Formerly they inhabited all the great tracts of forest which covered the larger part of England. Their comparatively small size, and the inferior growth of their antlers in Great Britain, also show that the exposed conditions of a typical deer-forest are not the most suitable for them. Fine beast though a well-grown Scotch stag may be, the spread of the best horns ever seen nowadays is far inferior to the finest specimens from south-eastern Europe, and also to those dug up from the peat, and probably dating from two to three thousand years back. The weakening effect of inbreeding

has been one cause of this deterioration of the stock ; and the natural tendency for stalkers to kill off the stags with the finest heads has also had some effect. But the main reason is simply that the feed is poor in a typical deer-forest, and the climate bleak ; and the deer do not grow to the same fine proportions as in more sheltered and fertile places. Park deer that lie warm and feed richly usually out-grow the stags of the open forests. Exmoor stags have comparatively poor heads in spite of the conditions more nearly approaching the ancient forest life. The reason in this case is partly that the soil and feed are generally poor, in spite of the ground being wooded, and partly owing to the deer being regularly hunted. This prevents them waxing fat in comfort, and laying on flesh and horn. The most active stags are frequently those with the poorest development of horns ; 'hummel' or hornless stags are among the most vigorous of their kind.

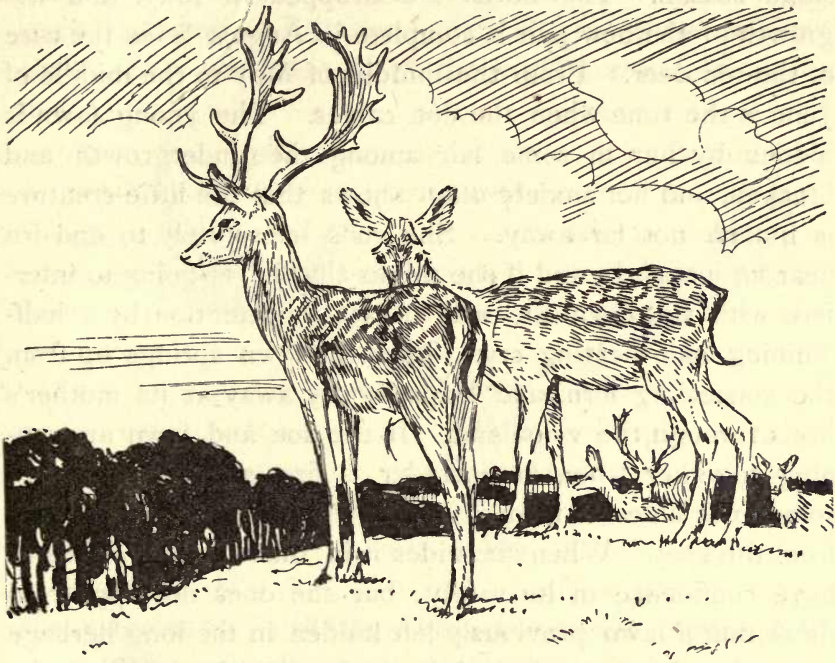
Late September and early October are the time of the red deers' rutting season, when their activity is at its height. They have put on the thick dark winter coat, with the shaggy pendent fringe on the throat ; and their horns are rubbed clean of the last trace of the velvet which covered them during their growth. Now they pursue the hinds, and bell in the autumn nights ; they fight with one another for leadership among the hinds' herd, and are dangerous to approach. The spreading antlers borne on powerful necks are a dangerous weapon. Stags do not often engage in desperate fights ; the weight and condition of the stronger beasts are well appreciated, and the junior gives in after a rather perfunctory display. But rousing fights sometimes occur between well-matched stags from different quarters of the forest, which have not grown up together and so learnt one another's strength. Sometimes, too, there is a great fight when the

stag which has long ruled the herd is dispossessed by a rising rival.

Stags eat little during the excitement of the rutting season, and are often much wasted by the end, when hard winter weather may set in. Unless severe weather makes them pack on the lowest and most sheltered ground, they abandon the more or less gregarious life which they live during autumn, and rove in small parties until the next autumn. In May they throw off the grey-brown winter coat, and put on the red-brown dress which gives them their distinctive name. The hinds calve in May and June, and grow bold in defence of their young. They have an inbred fear of dogs, derived from the old days when they were assailed by wolves, and will maul and even kill a dog by striking it with their forefeet. In May in Scotland, a few weeks later than in England, the stags also shed their horns. Very soon the new ones begin to appear as velvet-covered knobs; the growth is very rapid, so that by early August the new pair are complete, and the stag cleans them of their velvet coating by rubbing them against trees, posts, and palings. Then the stalking season begins in the Scotch forest, and stag-hunting on Exmoor. Besides these great headquarters of the red deer, and the handful still left in the New Forest, there is an ancient herd still surviving on the Cumberland fells between Helvellyn and Ullswater.

Fallow deer have existed for many centuries in the New Forest, and those of Windsor, Epping, and Rockingham, as well as in other parks where they were originally shut up and protected when the land around was enclosed. Red deer stand about four feet high at the withers, and fallow deer about three; but the smaller deer, though less majestic, is even more graceful. There are two distinct races, both of very ancient origin, and conspicuously distinguished by

colour. The commonest and handsomest variety has the well-known red-brown coat, spotted with white, in summer, and in winter becomes greyish-brown. The other variety is dark grey-brown all the year round, though in winter it becomes a little paler. The deer of Epping Forest are of



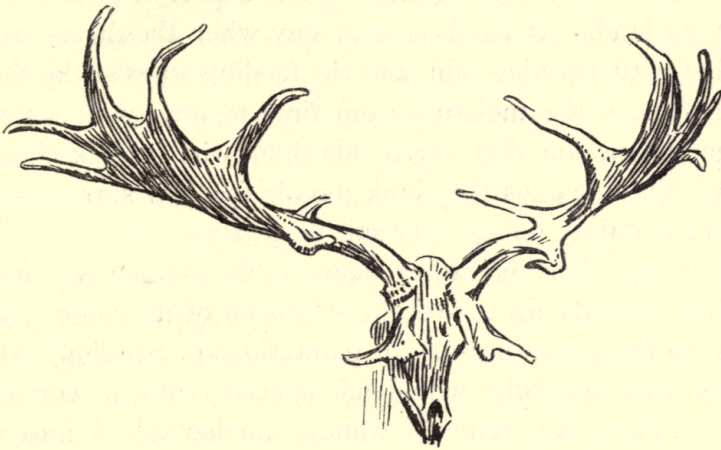
FALLOW DEER

this type. It is commonly said to have been introduced by James I.; but it is known to have existed earlier, and to have dwelt with the spotted variety in Windsor Forest in the fifteenth century. Besides these two main types, varieties of colour, including pure white, are not uncommon. The spotted variety is now found in a wild state in many parts of southern Europe and in Asia Minor; but the origin of the dark variety is unknown, though it probably arose from some local and semi-domesticated breed.

October is the rutting season of the fallow deer as well as the red deer; and the bucks kept in parks sometimes become dangerous at this season, though much less often than the red deer. Their cry is a kind of grunt or bark, much less sonorous than the voice of the red deer at the same season. The horns are dropped in May, and the growth of the new pair is complete in August, as in the case of the red deer. From the middle of May to the middle of June is the time when the doe calves. The young fawn is hidden by her in some lair among the undergrowth and bracken, and her anxiety often shows that the little creature is hidden not far away. She runs irresolutely to and fro near an intruder; and if she thinks that he is going to interfere with the fawn she will attract its attention by a half-whining, half-bleating cry. Then the fawn springs up from the concealing fern, and leaps lightly away at its mother's heels through the woodland. If the doe and fawn are running together when an intruder is first seen, the doe will sometimes hide the fawn in safe cover and run straight away from the spot. When she hides it in this way she seems to have confidence in its safety; but she does not appear to think that a fawn previously left hidden in the long herbage is safe against a man arriving subsequently. When the fawn grows stronger, in July, it follows its mother more regularly, and the pair speed off together at any alarm. As with the red deer, the fallow bucks only consort with the does in the mating season, and at other times wander together in small companies. In the semi-confinement of park life these parties are apt to be larger than in open forest; but bucks and does still feed some distance apart.

Fallow deer gain their name from their colour, like the red deer. Fallow is an old English word originally meaning pale yellow-brown, or light tawny red—very much what

we call 'fawn'—and the fact that this is the old name of the species confirms the view that the dappled variety has always been best known in England, and that the dark phase is a more recent introduction. Their horns are broader in the beam than those of the red deer, and approximate more closely to those of the reindeer and elk. Both these animals once flourished in Britain, as their remains show; and with them, as the sovereign of all the world's race of deer, roved



the magnificent Irish elk, which was really a giant fallow deer. This splendid beast stood half as high again as a modern red deer, and the span of its horns is between nine and ten feet across. Very few of the best red deer heads killed for many years past span forty inches. The most abundant and finest heads of the Irish elk have been found buried in or just beneath the layer of peat in Irish lakes and bogs; but they also occur in England and the south of Scotland. In some races of fallow deer this broad or palmate form of the horns is almost lost; it is very narrow in the deer of Epping Forest, which have rather degenerated owing to long isolation. Like red deer, fallow deer principally feed

on grass, but have an appetite for the leaves of many deciduous trees. They are also fond of gnawing the bark of thorn-trees. They are a more purely woodland species than the red deer, though less so than the roe. From the comparatively small size, the tameness, and the great beauty of the true 'fallow' or dappled breed in summer, they are far the most suitable of the British group of deer for keeping in most parks. The red deer is almost too large and wild an animal to fit in with the gentle sylvan aspect of typical English park land. It needs a grey day when the distances are blinded with drizzling rain, and the feeding stags shake themselves free of the moisture from time to time with a strong spasmodic motion that surrounds them with a thick cloud of spray. On fine days they look too big for their surroundings, which the dainty fallow deer suit perfectly.

The roe deer is rather remarkable among our larger English animals for the recent extension of its range. This is due to the great increase of plantations in Scotland, which supply this typically woodland species with a congenial home. They also tend to wander further afield into new plantations when their old woods grow dark and overshadowed, and the feeding consequently poor. Roe are thus growing noticeably commoner in many districts where planting has been general during the last half century, and are making their appearance in places where they have been unknown in living memory. Their increase as they populate fresh districts is only partly counterbalanced by their diminution in some of their old haunts. Their increase as the result of the extension of planting is comparable to that of the capercailzie in the same districts. In England the roe became almost extinct in the seventeenth and eighteenth centuries; it seems only to have kept a footing at Naworth Castle in Cumberland. But it was reintroduced into Dorset-

shire in 1800, and from its original home at Milton Abbas has extended far and wide. Though the roes are nowhere very numerous, owing to their solitary habits, and the lack of protection in many places, they are becoming a familiar species over a considerable part of Hampshire and Somersetshire, as well as Dorsetshire. They have reappeared in the New Forest, where they were long extinct. Their spread has been greatly helped on the Dorset and Hampshire border by the increase of plantations and self-sown thickets of the Scotch fir. The two Scotch species thrive and spread together. Probably the roe will gradually extend its range through a large part of the fir-clad region in the southern counties; but it loves sylvan quiet, and is never likely to settle in the more populous districts. Its dislike of disturbance is so marked that in spite of its comparatively small size it tends to wander away from Epping Forest, where it has been reintroduced, though the fallow deer are well content to stay. Its habits are wary and partly nocturnal, like those of the red deer. If the forest has quiet open glades in which it can browse the mixed herbage, it will feed by day; but if it inhabits a thick wood bordering open land, it will wait till night to come outside the wood to feed. Besides grass, it eats the leaves of holly and deciduous trees, shoots of heather and other various shrubs, and also raids growing corn, clover, and turnips. Its spread is therefore a good deal checked by the hostility of farmers, except on estates where it is carefully protected.

The roe differs considerably from both the red and fallow deer in the chief dates of its calendar. Early autumn for this species is the quiet time after the rutting season, when the reddish summer coat is changed for the thicker pelt of grey; and in November the bucks begin to shed their horns. The last horns are dropped by about the end

of the year; and the new pair are clean of velvet in April. Unlike the males of the other species, the roebuck keeps company with the doe throughout the winter; but though he is sometimes supposed to be strictly monogamous, his fidelity is not quite so unwavering. Sometimes accompanied by a fawn or two, a pair of roes often haunt the same tract of woods through the whole winter season; they usually form no such herds or parties of the separate sexes as are conspicuous in the case of the larger deer. When roes pack, it is a sign of very hard weather.



ROE DOE

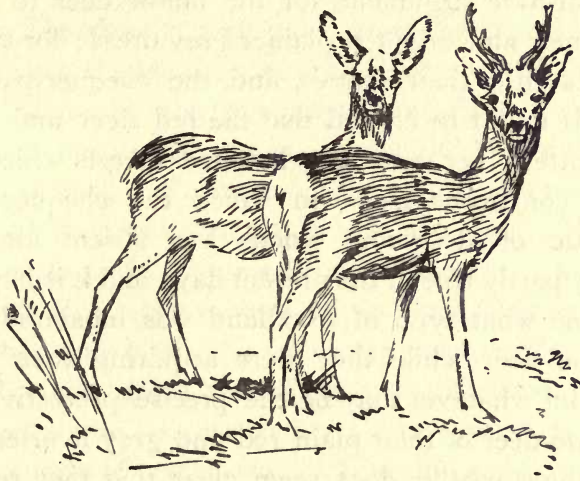
As spring comes on, the bucks tend to wander away from the does, often seeking higher ground. The young are born early in June, one or two in a family. The timid doe shows the usual maternal courage at this season, and will sometimes attack a human trespasser in the thicket where the fawns lie, or any four-footed enemy such as a dog or a fox. Foxes are the chief enemies of the roe; but in some parts of Scotland the fawns are now and then seized by the golden eagle. In the midst of the concealing brushwood the doe sometimes makes a soft bed for the fawns, and covers them with moss and plucked grass when she leaves them. The rutting season



ROEBUCK

of the roe is in July and August. As the roe only stands about two feet high at the withers to the red deer's four, and the fallow deer's three, its horns are naturally much less imposing. They are short, upright, and three-pointed, and their rough surface is very familiar in the shape of the 'stag's horn' handles of pocket-knives and carving-knives, most of which are supplied by the roe.

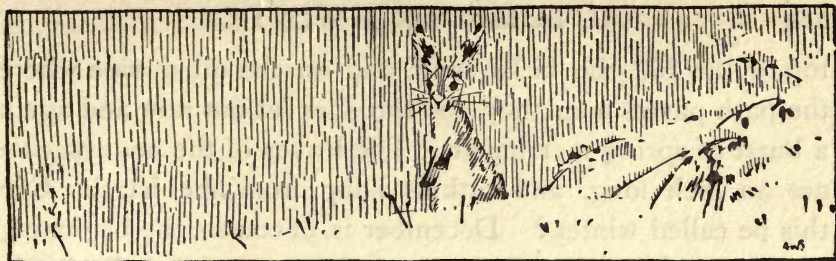
It is an axiom of natural history that the young of a



ROE DEER

species often reproduce the ancestral markings; and it is an interesting point that the young of all three species of deer are spotted with white. It thus appears that the normal dappled type of fallow deer in summer dress preserves the original livery of the whole group, from which both others have completely departed. Even the fallow deer has given up the traditional pattern in its winter dress, and at all times of the year in the case of the grey variety. All this must help to raise a doubt whether the spotted type of marking is really a highly protective device, gradually elaborated by ages of natural selection, as it is often held to be. The

evidence supplied by these three deer, and by various other animals and birds, points rather to the spotted livery being a primitive and imperfect design of very general occurrence, out of which many species have emerged. The spotted type of marking, as exemplified by the fallow deer, or panther, or spotted hyæna, is supposed to protect its wearer by blending with the chequered pattern of sunlight falling through deciduous foliage. It would therefore be reasonable enough, on the protective argument, for the fallow deer to lose its spots in winter and adopt a plainer grey dress; for the deciduous trees lose their leaves, and the chequer-pattern is missing. It might be argued that the red deer and the roe lost this pattern because they haunted forests chiefly consisting of coniferous trees, in which the chequer-pattern characteristic of deciduous woods was absent altogether. This is only partly true at the present day; and it is impossible to determine what type of woodland was inhabited by the red and roe deer while they were acquiring their present colours. But whatever may be the precise protective value for these two deer of their plain red and grey liveries, either now or in times past, it does seem clear that they represent Nature's perfected pattern, and that the spotted markings are an earlier pattern which they have outgrown.



WINTER

WINTER, in the Pickwickian sense, is rare in England. Except that the days grow short, that the solstice falls and the sun seems to stop still, giving five days of equal length on either side of Christmas, we should hardly be aware of winter's arrival. We may pick snowdrops, primroses, and even outdoor strawberries on Christmas Day. We may hear the thrushes sing. We may ride to hounds on either side of Christmas Day. Snow, very rare in November, is still rare in December, and often the frosts are much milder than those which brought down the ash leaves in October. The 'old-fashioned winter' seems to have disappeared as completely as 'the snows of yester year.' Now and again, of course, we have had great frosts round the week of shortest days. In 1860, a sudden frost after open weather bridged the rivers. The thermometer was below zero, and there was skating on the Ouse on Christmas Day. Those born since then have enjoyed a longer period of skating in March than in December, and some of the most serious drifts have been in Easter week.

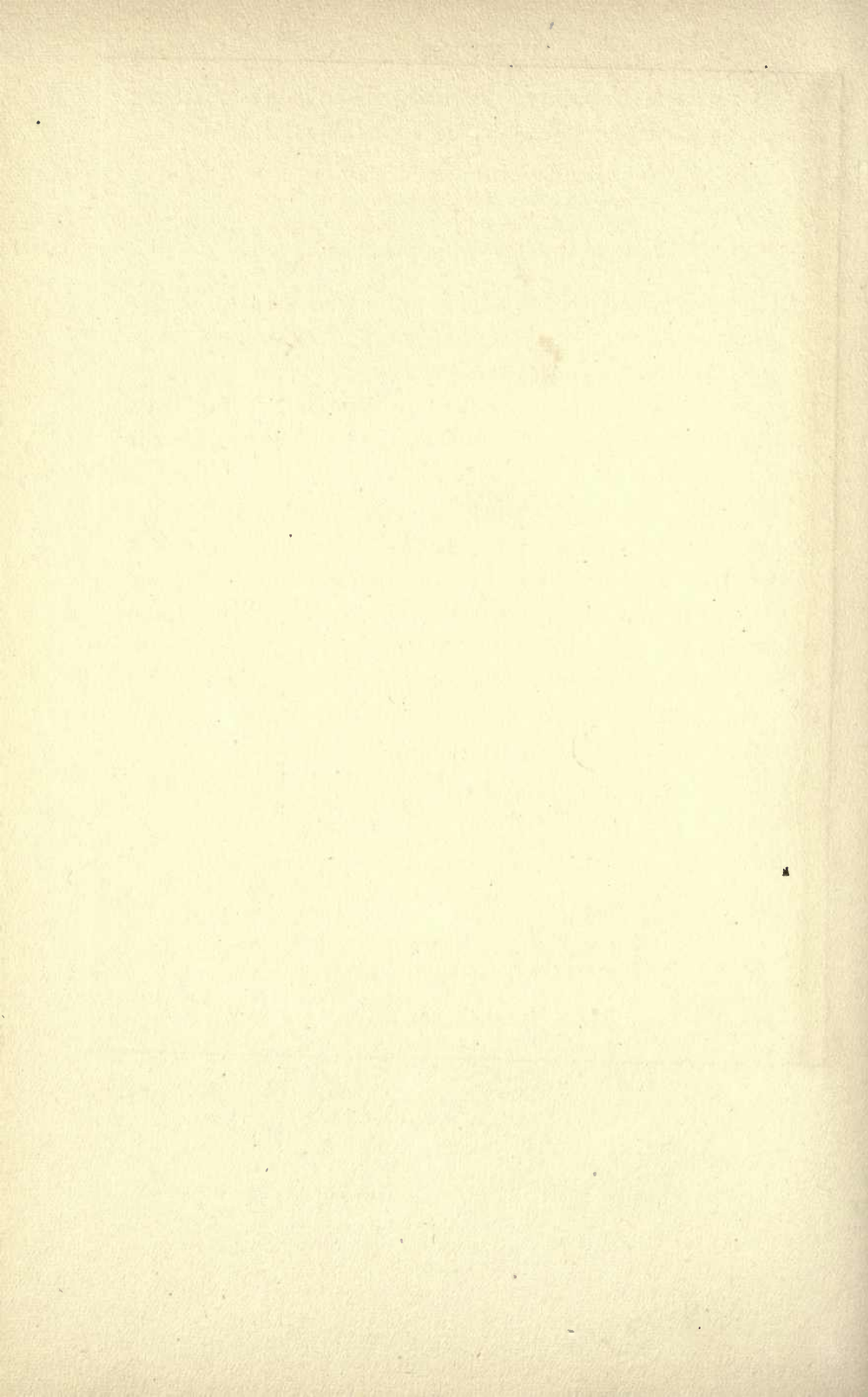
The impression left from many Christmas Day walks upon the memory of a dweller in the southern half of England, is a picture of green fields. The green grass leads to a path across the ploughs, where on either side the blades of wheat or winter oats gleam almost transparent in the sun. At the

top of the hill the larks sang, and on the other side where the path passes a spinney, the thrushes let out now and again a burst of spring merriment. The leaves of the honeysuckle are an inch long, and catkins hang from the hazel. Can this be called winter? December is, of course, the beginning not the middle of winter, as we often regard it. Presently bitter and perhaps 'bearing' frosts will change all this. The wheat will be happily protected under snow or, if it is too luxuriant—'winter proud' in the delightful country phrase—and snow is sparing it may be cut to death. Yet one of the necessary qualities of winter is absent when we enter a new year. 'Vere novo incipiendus erat'; we ought to have begun our year in spring. But most of us feel the argument, expressed with great force by a Lancashire naturalist, that spring begins as soon as the days lengthen. The drawing out of the days influences us almost as much as it stirs and encourages the birds. They exult marvellously in longer hours of sunlight. A curious example was found in the Zoological Gardens where numbers of the small equatorial birds at first perished of darkness. It was against their instinct to feed in gloom and twilight: they would rather starve. When at last a sympathetic keeper lengthened day by the aid of electric light, their health and appetite returned. It is so with our native birds.

Longer hours of sunlight have their effect, however stern or cloudy the weather may be. Of course, very hard frost, if it lasts long, ruffles their feathers and may even kill them through starvation, but at a breath of warmth or moisture the sense of spring, of a new life returns. One cannot remember a year where partridges have not paired before January was out, or when spring songs had not been heard from tits and hedge-sparrows. Every January some of the spring flowers are out, and the number is increasing at great

WINTER
By BUXTON KNIGHT





rate all through February. Already Tennyson's neat but perhaps too particular lines become applicable :

' Now fades the last long streak of snow,
 Now burgeons every maze of quick
 About the flowering squares, and thick
 By ashen roots the violets grow.'

By March 25, when technically winter ends, the world has been enjoying an orgy of spring gardening, especially of seed-sowing. So, however crabbed winter may be, spring is always in its lap, and the season in England is the least real of all the seasons : ' If winter comes shall spring be far behind ? '

The feeling of the unreality of winter results, it may be, from an incidental course of too gentle because unseasonable weather over the new century. In the future, we shall no doubt taste again the Shakespearean or the Pickwickian Christmas. In the earliest of all his plays Shakespeare, out-topping others in his native manner, put the sense of a really seasonable, what we call an old-fashioned, winter into two stanzas where each line is a picture :

' When icicles hang by the wall,
 And Dick the shepherd blows his nail,
 And Tom bears logs into the hall,
 And milk comes frozen home in the pail ;
 When blood is nipt and ways be foul,
 Then nightly sings the staring owl :
 Tu-whit, tu-who. A merry note.
 While greasy Joan doth keel the pot.

When all about the wind doth blow,
 And coughing drowns the parson's saw,
 And birds sit brooding in the snow,
 And Marion's nose looks red and raw ;
 When roasted crabs hiss in the bowl—
 Then nightly sings the staring owl :
 Tu-whit, tu-who. A merry note.
 While greasy Joan doth keel the pot.'

Such pictures still hold. In the fen country, which receives the first brunt of the east winds, one remembers hearing the ice tinkle against the sides of the milk cans being carried home by the children ; and pictures straight from Holland have arisen along the great dykes of that wonderful country. On the meres the fenmen played at bandy, and along the dykes they set off in queues, swinging arms and legs in time, on twenty or thirty mile journeys, as if the iceway were an established thoroughfare in their country. Wonderful accounts of winter which was really winter were written of this district hundreds of years ago. Not only was winter, winter, but the country, country. The place was rough and wild : and man struggled for life along with the beasts. In winter he fished and trapped.

December, nevertheless, is the deadest month of the year ; and though when winter begins, at the end of December, the awakening is near, you must still peer closely and with knowledge to find the signs of life. The trees are still

‘ Bare, ruined choirs where late the sweet birds sang.’

In spite of Christmas roses and some spring flowers, in spite of spikes of bulb stems which ‘ hail far summer with a lifted spear,’ in spite of the spawning of fishes and the rush of the salmon, and the seeding of mosses, the world is in outward appearance flowerless and leafless and lifeless. Whether a bright and starry sky follows the setting of a sun blood-red in the mist, or whether ways are foul, and the air dark and the heavens murky and the winds wild, the season speaks its lesson. Its mood is perceptible. Perhaps because there are few things to notice in the winter landscape, the few are the more firmly implanted in the memory. The bare forms of trees are more easy to remember than the green domes. The green woodpecker, who laughs as he travels in his ridge

and furrow flight across the fields ; the rattle of the withered leaves of the oak ; the tracery of a filigree frost pattern on the holly-leaf, take a peculiar importance. Is there any sound so characteristic of a season as the tinkle of a stone slid across a sheet of black ice or the fall of an ice-film held for a while above the sunken water by a bush, spray, or rush.

Yet even in midwinter some things will put on a spring-like greenness. Two classes of plant have essentially a winter prominence, the mosses and the lichens. Some of the mosses seed in winter, anticipating our spring as the salmon do ; and the lichens exult in winter weather, for they depend wholly on air-borne moisture.

Both are characteristic rather of the west than the east. In the winter woods of Ireland the trees are so heavy with lichens that they look to be in the last stage of decay, while on the east the trees are only less trim than the apple-trees of a modern fruit orchard, just treated with a caustic spray. Some of the eastern counties are very poor in mosses which abound in the woods of Westmorland.

The little seeding caps standing up daintily on the mosses, the bright green pillows, where you will certainly find a colony of spiders, join with the meadow grasses to destroy the impression of winter, and bring us back to its unreality. At the worst we see winter only in short bouts. Any one who keeps a diary through these months will find it full of springlike events. 'January 12th, A robin's nest and egg found in . . . garden (Surrey).' 'December 29th, Primroses plentiful in Cook's spinney (Hertfordshire).' 'January 15th, Tits singing spring songs and inspecting nest-boxes.' 'December 20th, Choisya in full flower under south wall.' 'January 17th, Groundsel seeding, seeds being well set.' It would be easy to continue quoting such events for many

pages. Some few birds always nest in February. The earliest of all is the crossbill, which in these later days has settled itself in many parts of England, and is no longer a rather rare visitor. In certain Norfolk and Surrey pine-woods you may invariably find nests with eggs in the third week of February. The birds begin to build in January, thus anticipating that hoary pioneer of spring the raven, which with this exception is the earliest builder.

Now again we see in February the very first of our so-called summer migrants, though many suspect that the very early chiff-chaffs, often recorded, come not from overseas but from the warm counties of perpetual spring in south-west England. In Cornwall one might lay it down, with no more qualification than 'once in a blue-moon,' that winter is unknown.

This absence of winter during winter has this drawback, that the season, having missed its cue, tries, as it were, to make all sorts of ill-timed and belated appearances. It is quickly warned off the stage; but often not before it has interfered with the piece in a lamentable manner. The only really evil thing of regular recurrence in the English climate is the late frost; and the very rapidity of its ejection increases the damage. One would be as confident in prophesying that there would be a frost on, say, May 11th as on December 25th.

So it is that we never prepare for winter as they do in other northern countries. In London are no arrangements whatever for getting rid of snow, which always surprises the authorities. When our poets deal with winter, which is seldom, they dwell on its breaking up rather than its lasting rigour. So Matthew Arnold:—

'And as in winter when the frost breaks up—
At winter's end, before the spring begins

And a warm west wind blows, and thaw sets in—
After an hour a dripping sound is heard
In all the forests, and the soft strewn snow
Under the trees is dibbled thick with holes,
And from the boughs the snow loads shuffle down,
And in fields sloping to the south, dark plots
Of grass peep out amid surrounding snow
And widen.'

Thaw and frost we regard as a Box and Cox. A thaw after three white frosts is the commonest of county prophecies; and as often as not it does not wait for the third. The astonishing difference that two hundred or three hundred miles make is only less remarkable in frost than in rainfall. Almost every year the fenmen in the neighbourhood of Ely have a day or two on the ice. In South Wales or Cornwall it is common to find people who have never donned a skate, and the boys all strangers even to the 'postman's knock' on a slide.

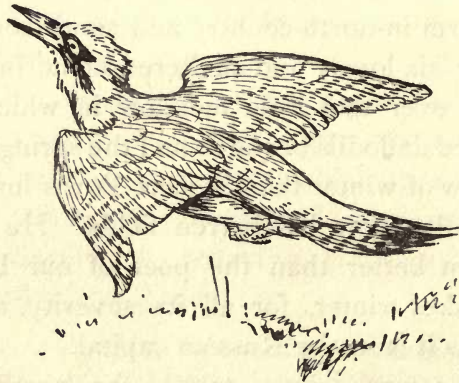
It is in winter more distinctly than in summer we see the width of the differences between one part of England and another. In summer the chief contrast is between east and west. That still holds, but now a greater appears between north and south. Winter is always real winter in Scotland for some part of the season; and this sense of winter appears in very vivid form in north-country and south-country poets. Tennyson, from his lovely and sheltered home in the Isle of Wight, looking over that wide meadow in which the lifted spears of crowded daffodils began to hail the spring in January, had another view of winter than Robert Burns lurching on to his plough-handles over his barren fields. He knew what winter was even better than the poet of our Lady of the Snows, who makes winter, for all its severity, a merry and active season, as it is in the Russian capital.

Whichever course winter takes, the northern or the

southern, it is a time of observation hardly less rich than other seasons. Coleridge perhaps of all writers most nicely touched its spirit :

‘ Therefore all seasons shall be sweet to thee,
 Whether the summer clothes the general earth
 With greenness, or the robin sit and sing
 Betwixt the tufts of snow on the bare branch
 Of mossy apple-trees, while the high thatch
 Smokes in the sun-thaw ; whether the eve-drops fall
 Heard only in the trances of the blast,
 Or if the secret ministry of frost
 Shall hang them up in silent icicles
 Quietly shining to the quiet moon.’

Certainly in winter the sky takes a new importance, by day or night. Our weather prophecies chiefly refer, if not to winter, to the wintry half of the year. ‘A red sky in the morning is a shepherd’s warning ; a red sky at night is a shepherd’s delight,’ is one weather-rhyme that most properly belongs to winter when the flocks need protection. And at night when the frost comes how Orion gleams in the south-west, Cassiopeia is printed in capitals overhead, and the constellations, the Gemini, Canis Major, and the rest seem visibly to swing round the Great Bear.





DECEMBER

'Thou saw the fields laid bare an' waste,
An' weary winter comin' fast,
An' cosie here, beneath the blast,
Thou thought to dwell,
Till crash! the cruel couler past
Out thro' thy cell.'

BURNS, *To a Mouse.*

THE COUNTRY CALENDAR

NATURE is less active in December than at any date in the year. It is a month of rest; and the only young leaf among wild plants, always-excepting the wild grasses and winter weeds, is the honey-suckle's, which is proof against frost and foul weather. Though in statistics the drier half of the year begins, winter is announced clearly. We all feel the shortness of the days. Indoor merriment is at its zenith; and we decorate with the berries that are becoming the only food of the birds. The thrushes are sowing the mistletoe seeds, wiped from their beak on the bark, as well as hips and haws and holly stones under the bushes.

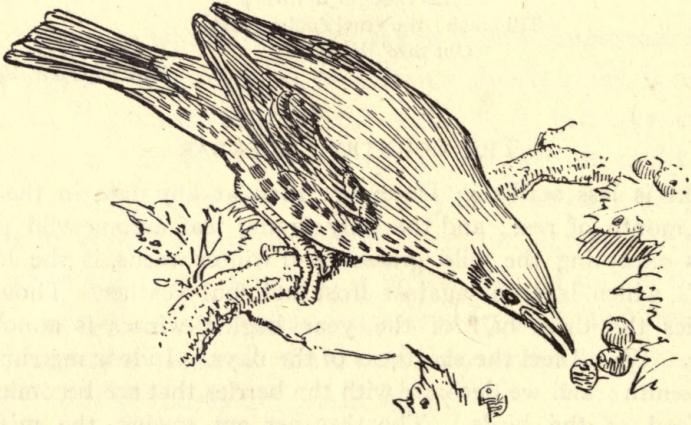
One of the earliest authorities on seasonal weather selected December 3rd to 9th as one of the regular warm spells, strangely interpolated into our English winter. The Marshams recorded two 'indications of spring' in December. On the 15th snowdrops, and on the 26th the turnip flowered. But there are many more indications. Primroses almost always flower freely. Hints of a new year come in the slow lengthening of the days and in the first restoration of the hunter's truce. Look for intense cold if the barometer falls with a northerly or westerly wind.

December 10th.—Grouse and black game shooting ends.

December 22nd: The Winter Solstice.—The sun enters Capricorn.

Winter begins. The days are at their shortest. It is a curious astronomical accident that the evenings lengthen but not the mornings. The sun, which rises at 8.6 on December 21, rises little later on January 6th.

Average temperature, 40°.
 Average rainfall, 1.77 inches.
 On December 1st, sun rises 7.45 a.m. and sets 3.53 p.m.





FEEDING BIRDS

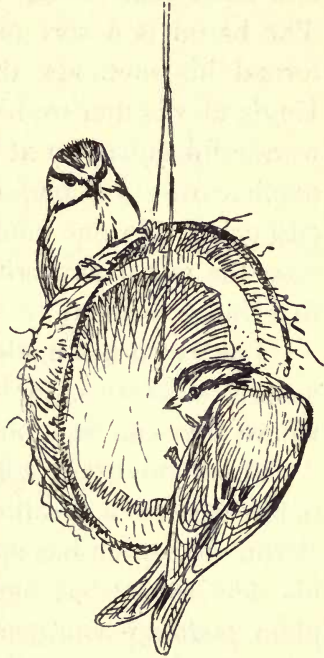
A BIRD table is now becoming a necessary piece of furniture in country gardens. But it is well to remember that January and February (not December) are the months when the duty of feeding birds is most insistent, and the profit greatest. Birds can endure starvation in early winter; indeed they naturally then reduce their feeding; but as the days lengthen they grow as hungry as a cabbage caterpillar. Not seldom the beginnings of this access of hunger will coincide with a period when the frost cuts off all food-supplies, save the scraps of dead creatures stuck in the resin of the fir and larch, or in the cracks of the bark. Happily this winter amusement and duty of feeding birds is becoming very popular in England; and abroad the Governments are gravely considering the economical wisdom of encouraging the practice. Indeed every year more of our gardens—even the little rectangles in towns and suburbs—are becoming sanctuaries to which birds of many species resort from the worst of all enemies, hunger, and for the best of all pleasures, a nesting home.

During the twentieth century we have seen birds grow perceptibly tamer and vastly more numerous. It is a wonderful addition to life to eat with the birds, as it were, to tempt them on to the window-sill, if not within the room.

For birds are tamer than we think. The man whom we used to watch in the Luxembourg Gardens in Paris had no special charm by which the sparrows were drawn to settle on his shoulders and to peck from his hands. If he possessed the qualities of St. Francis, they were not obvious on simple inspection. It is indeed an easy thing to get into touch with birds; to induce a gull on the embankment to take a sprat from your fingers, or to tempt a robin to the breakfast-table, or tits to a cocoa-nut within the window, or sparrows to your feet. Any invalid has the chance of realising this and taking profit by it. An open window and a tray of crumbs may make all the difference between a cheery and wretched period of illness or convalescence. More than one particular picture comes to the mind. The first is an invalid's room in Dorset. As a beginning the window-sill was scattered with crumbs each morning. Then a tray was fixed so as to extend the table. As spring began to warm the air the window was opened as often as might be, and the tray fixed inside instead of out. The change made no difference to the birds. Blue-tits, great-tits, cole-tits, robins, chaffinches, and an occasional wagtail came gaily into the room; and it was noticeable that the birds less tame, one would say, by nature, and especially the chaffinches, showed even less nervousness than the robins when they had conquered their first fears. Another picture of this sort is set in the frames of windows looking on a beautiful garden sanctuary in the Isle of Wight. But we may all do the same; the extended window-sill is the first and best attraction. If it be put before the window in sight of the breakfast-table it will pay 100 per cent. in the first week.

One of the best of all tamers was that charming naturalist, whose invalid state suggested the study of natural history as a solace, Mrs. Brightwen. The poet

Cowper's happy family, whose playful and affectionate ways assuaged the melancholy of his madness, less deserve fame than her household of birds and mammals, from which she drew intense satisfaction to within a few minutes of her death. Falstaff—not in Shakespeare perhaps, but in a brilliant emendation of Shakespeare—'babbled o' green fields' as he lay dying; and there is something Shakespearean in the last hours of this modern naturalist. 'In her dying moments,' wrote Mr. Gosse, 'she was attended by those wild creatures, who had long been accustomed to her presence. When I took farewell of her, two squirrels were gambolling and struggling on the toilet-table, and a robin was seated on the edge of her cup. Her last conscious moments were gladdened by the sound of the cuckoo calling from the height of the great tulip-tree opposite her bedroom window, and awakening one more flash in her sympathetic eyes.' She laid great stress on winter feeding, which 'gave her great insight into the habits and traits of otherwise shy birds, as then, to a lesser extent, and at all times, a large collection of birds were to be seen in front of the windows, in size ranging from a pheasant to the tiny tits; even the fussy water birds were enticed on to the lawn and under the tulip-tree.'



BLUE-TITS

If the birds are hungry and you have food, all the 'conditions precedent' to a common understanding exist and will exert a compelling influence. There is virtue in

elaborating a little the simple art of feeding the hungry, though the dietetic science as taught by some of the professors has a touch of absurdity in it. However, it is to be confessed that some very astonishing results have been achieved in Germany by the scientific baron who has devoted himself to the work of encouraging birds to breed and feed and have their being in his garden and park and woods. The baron is a sort of latter-day Winterton; and however formal his methods, they are not without hints for us in England, whether we have a two-thousand acre park, like the wonderful sanctuary at Woburn, or a rectangular rod, pole or perch close to London or other town—indeed within the city pale. No one could more profitably follow his example than the public authorities who attend to the parks and the live things in them.

The baron has made a speciality of feeding apparatus and nesting apparatus, for birds will come first to those places where they can find most suitable food and nesting places.

Food, however, comes first, and food is a subject that really requires a certain amount of scientific thought, such as Baron Burlepsch has spent on it. The most engaging of all his devices is what has been called the Christmas tree and plum pudding arrangement. The tree can either be a real tree—for preference, a small spruce, such as those sold for Christmas trees—or it can be a made-up tree, artificially put together in the manner practised on a large scale by Mr. Thomson Seton in his sanctuary in New York State. In a garden the tree can be put up within sight of the window. This tree is to play the part of a widow's cruse. It is to ooze plum pudding, as it were, as a fir-tree oozes resin. It is a not uncommon practice to smear boughs with the remainder of the breakfast porridge reinforced by crumbs and scraps; and birds of all sort appreciate it highly. But the baron has

played the scientific doctor in this matter. He makes a pudding or porridge or olla podrida, which is a compound of the sorts of food that birds most enjoy and most flourish on.

The following is his ideal recipe :—

White bread, (dried and ground),	.	.	4½ oz.
Meat, (" " "),	.	.	3 "
Hemp, . . . . .	.	.	6 "
Crushed hemp,	.	.	3 "
Maize, . . . . .	.	.	3 "
Poppy flour, . . . . .	.	.	1½ "
Millet, white, . . . . .	.	.	3 "
Oats, . . . . .	.	.	1½ "
Dried elder-berries, . . . . .	.	.	1½ "
Sunflower seed, . . . . .	.	.	1½ "
Ants' eggs, . . . . .	.	.	1½ "

This elaborate mixture is incorporated into a mass of fat or suet equal to nearly twice as much as the whole of the previous mixture. The pudding is heated and poured over the branches and trunk, over which it forms a film; and to these rich and succulent boughs the birds will flock, pecking at the plums in the collection from every conceivable attitude—robins on tip-toe, tits upside down, thrushes blundering about, and warblers alighting daintily. Of course the food need not be so elaborate as the baron's, but if it contains some meat and some seeds, so much the better. It is a good plan to collect the seeds of elder or sunflower at the right season, and keep them for the birds against the hungry hours of the year. The really important thing is to pour the mixture on the trees when it is boiling hot, so that quite a fine coating is spread as widely as possible.

Another idea is a 'food stick.' A succession of holes are cut or scooped out of a narrow bough which is then nailed across a trunk. It provides a very handy and picturesque way of feeding tits and tree-creepers, and the

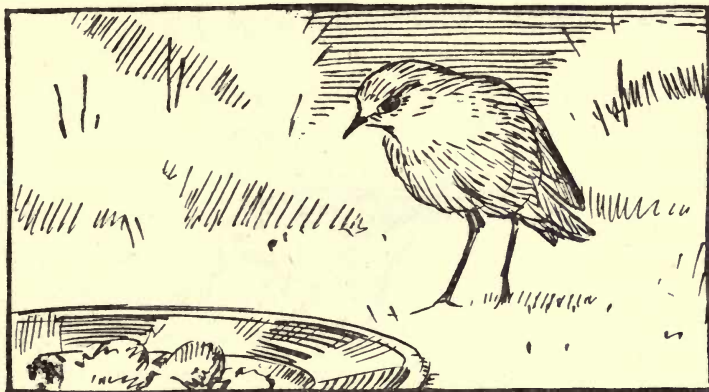
food can be well protected against the weather if the holes are faced to one side. As might be expected, a quantity of more elaborate methods are practised in the German sanctuary. There are food bills and food hutches and houses of many sorts designed to protect the food from the weather and to attract the birds. Some of them would be a great addition to the London parks, but they would not be of less use in gardens.

These methods have been elaborated for some years, but the economic value has only recently become apparent, and induced the German Government to take this model sanctuary under its wing, following an example set by Hungary, where the Government assists the study of migration with as good results as have followed its teaching of economic ornithology.

Every one finds it easy enough to attract the common birds and some of the bolder. The cole-tit and march-tit may in some neighbourhoods be regarded as more or less uncommon or at least hard to find; but they will at once come to the suspended fat on the Christmas tree. Other birds are not so bold as the tits; and to draw them more care must be taken and their habits more closely observed. The nuthatch is one. He seems to have as shrewd a sense for a nut as a vulture for a carcass. You may offer any sort of food; and never discover that nuthatches exist; but if a frame be fixed with wire or wood in front to hold the nuts without hiding them it is odds that the nuthatches arrive within a week. The better plan with all the shyer birds is at first to put the food in the places where they are most likely to be rather than where you wish them to be. When once they have found food within your precincts the rest is easy. They may be tempted nearer and nearer; or out of the obscure into the open with some ease.

Some birds baffle all attempts ; but among the untamable are very few of our native birds or indeed our winter visitors. The obstinate are the summer migrants ; and the timidest of all perhaps is the wryneck. Among the easiest are game birds, and the partridge at any rate pays for his food ; he is delightful to watch.

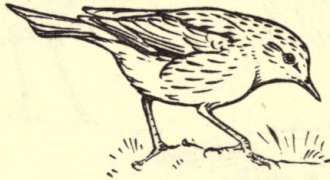
Some few birds are so persistent that they will learn to take food in ways entirely foreign to their nature. In a small garden in the Midlands one starling, after weeks of



ROBIN

endeavour, learnt to take the fat meant for the tits. His discovery came by a sort of accident. He perched on the end of the bar where hung the suspended fat, and after long gazing tried to manipulate the string. In doing so he half tumbled, so it seemed, but getting both claws on to the string, slipped down, and found himself to his surprise safely landed where he would be. On the following days he performed this acrobatic feat with increasing skill and of deliberate purpose. Later other starlings, observing the success of the manœuvre, followed the example ; and in order to save the fat for the proper feasters the string had to be lengthened.

In the same way robins will now and again learn to take a precarious stand on a swinging cocoa-nut; but they do not often repeat the attempt. A starling is of all birds perhaps the most deliberate imitator; imitative in his songs and sounds, imitative in all his ways. It is, for example, by no means uncommon to see starlings, short though their wings are, pick up food off the surface of the Thames. They have learnt the art, though they remain clumsy in the technique, from the gulls, who do not mind a wetting and have wings suited for the purpose.





TREE FORMS IN WINTER

THE true forms of trees can be best appreciated in winter, when the deciduous species are bare of leaves, and the evergreens stand out more conspicuously in the naked woods. The green leaves of summer half muffle and disguise the essential architecture of the trunk and boughs; and it is only in winter or early spring that we can see how one tree differs from another in strength of build, and in the arrangement of the leaf-bearing twigs. The best time for learning to distinguish trees is in midwinter, after the last leaves have fallen from the tall oaks, and of all the deciduous foliage only a few patches of oak and beech and hornbeam scrub keep a russet mantle clinging until spring. As spring comes on, our attention is apt to be distracted from the permanent forms of the trunk and branches by the budding of the earliest shoots and blossoms, and by the anticipation of the period of awakening. In the heart of winter there is a strength and endurance about the lines of forest trees which suits the mood of the time. We learn to appreciate their beauty, devoid of luxuriance, and find a pleasure in bare boughs which is in some ways greater than the delight in the full foliage of May.

Most trees can be recognised even at a distance by the

characteristic form of their trunk, boughs, and twigs ; and at close quarters identification is helped by their bark. Except, perhaps, for an occasional immature sapling, of which the growth is still indeterminate, or for a warped and stunted specimen growing on bad soil and in vitiated air, every tree can be recognised as certainly in winter as in summer by a practised eye. The strength of the oak stands out twice as clearly when it is stripped of its leaves, and the contrast of



OAK

its stalwart lines with the feminine grace of the beech or the wych-elm becomes more visible. Oak boughs traced against a winter sky make one of the most beautiful sights in English Nature. The peculiar attraction of the oak lies in its combination of endlessly varied curves with essential strength of structure. If we observe the lines of a well-grown oak clearly silhouetted against a sunset glow, we see what a wealth of design it has in its larger boughs and branches as compared with the simplicity of the elm's few large limbs, or the angular and uninventive structure of the black poplar. Oak boughs twist and curve with almost fantastic freedom ; and

yet there is unmistakable power in every curve. When the wind arises, every crook and curve becomes a tough resilient spring; the small boughs dance to the gale with a steely quiver, and the pressure of the wind is transferred to the larger limbs. These have a similar reserve of power in their great bent lines, which can yield sufficiently to dissipate the pressure of the blast without being forced back so far as to



WALNUT

snap. The fullest strength of the oak is reached in its thick trunk, buttressed roots above ground, and the depth to which they reach beneath the soil.

Other trees with characteristically curving boughs are the walnut and the plane. At a first glance in winter an old walnut-tree often looks very like an oak. Its boughs seem to take the same delight in crooks and curves; and when it has a stalwart trunk below, it is often a very fine tree. But when we examine it a little closer, every point of resemblance to the oak brings out an equally conspicuous difference. The curves are both fewer and noticeably softer; the tree has not

the oak's characteristic appearance of having each bough tensely braced against the onset of a storm. The main limbs of the walnut are also longer and more straggling in proportion to the amount of their support; this makes them weaker, and they are more often torn off by a gale. As we trace the lines of a main bough as it ramifies into smaller branches, and onwards as the branches become twigs, we see how at every stage it lacks the oak's wealth of design. Its outer fabric is emptier of pattern; and when we come to the outmost twigs, they make a thin network against the sky, very different from the oak's innumerable knotted spurs, and more like the blunt tips of the ash. Well-grown old planes are chiefly seen in London and a few country gardens; they have never gained a thoroughly acclimatised status in the woods and fields. They combine strength with sinuousness to a remarkable degree; many of their boughs writhe like a captive snake; yet they very rarely succumb to a storm. They also grow to a fine girth, both in the trunk and in the main limbs. Yet in spite of their real toughness, and the massive dignity of the largest English specimens, they do not possess the peculiar aspect of power which is seen in the oak. Even more than in the case of the walnut, the boughs seem to writhe idly and uncontrolled, instead of framing every curve to withstand the violence of the south-west. And they have not the oak's accurate proportions, which give so conspicuous and satisfying a sense of power. The boughs twist independently of the lines of the main limbs and of the trunk; and often a long thin wandering bough will start off at an erratic angle from the flank of a massive stem. These characteristics are most marked in English specimens; in central and southern Europe, where the plane grows to a greater size than here, it is also better proportioned. But the same features are still noticeable,

though the large growth of the trunk and main limbs helps to conceal the sinuousness of the boughs; and the most magnificent plane has little of the tense strength of the oak.



PLANE

It is pre-eminently a shade-tree, like its relation the sycamore; but no one thinks first and foremost of the oak's shade.

The ash can be recognised by its moderate height and breadth of head, and by the characteristically blunt and spare design of its lesser boughs and twigs. Compared with the beech or the elm, it might almost be said to be twigless; the reason of this is that its large palmate leaves cover a large air-space in proportion to their foothold on the spur,



ASH

while the small and abundant leaves of the beech and elm need plentiful twigs to support them. It is a general rule that the larger or more numerous are a tree's leaves, the denser will be its winter pattern. The bare and blunt appearance of the ash is increased by the smooth bark of its lesser boughs, and by its thick black buds. The light grey-green rind shows pale and glossy against the winter light; and the black winter buds push out at the ends of the spurs. The bark of the trunk and larger boughs is also paler in colour than that of most other trees, but is furrowed with grooves of medium depth, more closely set together as the tree grows older. This furrowing of the bark begins in young trees as a series of vertical cracks or tears, parting the smooth rind. The corrugations thus produced are closer and shallower than those of most other trees with ribbed bark. In combination with its pale and glossy colour, this pattern makes an ash trunk easy to

identify, apart from the pattern of its boughs. The bark of the walnut is of much the same pale colour, but the furrows are wider apart. The hard, dark and deeply furrowed bark of the oak is well known; it is one of the trees which shelter the pupæ of many insects in its deep grooves.



ELMS

Very different from the spare tracery of the outer boughs of the ash are the dense heads of twigs formed by the beech and elm. Though possessing this general similarity, both are very individual trees, and easily distinguishable. The height and rich rounded curves of the elm make a well-grown specimen one of the finest of our trees. In bleak

situations, or towards the northern limit of its English range, it is much less distinguished; but it is still easily recognisable by its height in proportion to its breadth, the dense and rounded lines of its smaller branches, and the sheaf or frill of short twigs which usually surround its trunk. Its bark is



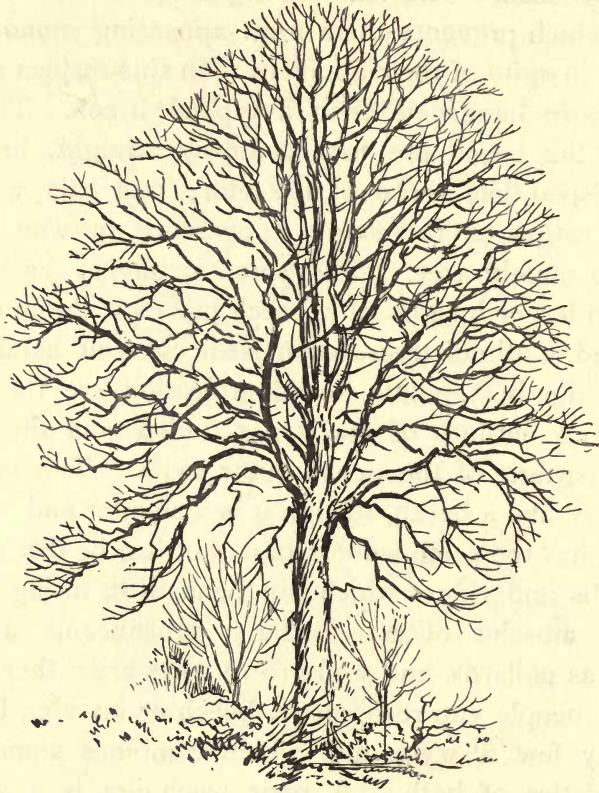
HORNBEAMS

softer than that of the ash or oak, and the grooves are less strictly parallel, running into one another every few inches. Though its great height and spread of limb make it one of the noblest of English trees, its roots run close to the surface, and thus give it a poor hold on the soil. It is the weakest of all large trees in withstanding a gale; and it has an even more dangerous way of occasionally dropping a bough, with

no more than a crack of warning, on a perfectly calm summer day, when the weight of the leaves overcomes a feeble spot in the wood. This density of the leaves is associated with the thick network of the smaller twigs, by which the elm can be distinguished. The leaf-bearing twigs have a variety of pattern which prevents them from appearing monotonously crowded, in spite of their numbers. In this respect a typical elm is more handsome than a typical beech. The outer twigs of the beech are monotonously straight, instead of being crisped like those of the elm; and this sometimes gives a rather uninteresting appearance in winter to an otherwise stately tree. The smooth, silvery bark of the trunk and larger boughs of a beech makes it the most easily recognised of all our trees, when seen close at hand. At a distance, the best points for identification are the smooth and sinuous outlines of the larger timber, and the straight hairlike pattern of the dense outer twigs. The hornbeam grows very like a beech, though it is a smaller and slenderer tree. It has the same smooth bark, but can be distinguished by the ribs and ridges which run beneath it, lifting the skin like the muscles of a wrestler. Hornbeams are most frequent as pollards, and well-grown trees are rather rare.

Most people can recognise a beech or an elm, but comparatively few a wych-elm, which combines some of the characteristics of both. A poor wych-elm is a very dull tree, without even that appearance of straightness and tallness which marks a small elm. But a well-grown wych-elm is a very beautiful object. It is a shorter and broader tree than the elm or beech; its special beauty lies in its beautiful proportions, which are as conspicuous as those of an oak, but of an entirely different kind. The wych-elm is as feminine as the oak is masculine. All its lines are gradual and delicate; it has no tense crooks or rugged elbows. In

a fine typical specimen, the trunk parts fairly low down into several ascending limbs, which ramify evenly outwards into a densely rounded head. There is none of that abrupt transition from thick to thin stems, or from curves to straight



WYCH-ELM

lines, which detracts from the beauty of many trees; everything is well-proportioned, to the very tips of the sensitive outer twigs. The pattern of these outer twigs is much like that of the beech; but even when they are densest and straightest, it is saved from monotony by its perfect proportion to all the rest of the tree. The wych-elm's bark is ribbed with straighter and narrower ribs than that of the

elm; its whole surface is less deeply incised. The wych-elm is found in most parts of Britain, and is the original native member of the family. The common elm is believed to have been introduced from the Continent by the Romans, and has never made its way into the north of England, where the wych-elm is the 'elm,' pure and simple, and assumes a new importance in the landscape, as does the sycamore.

Sycamores are common in most places where trees will flourish, but are most frequent and conspicuous in gardens

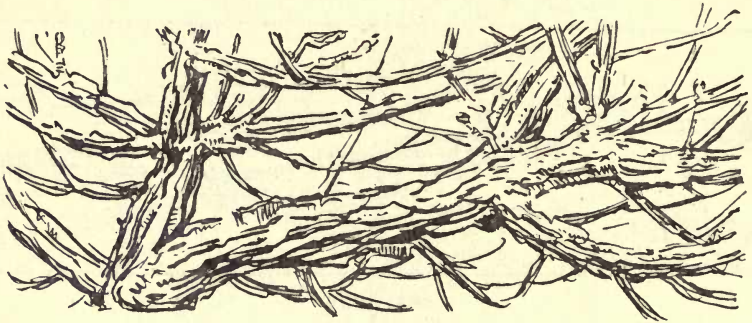


SYCAMORE

in the north of England and Scotland, where they are much grown for the sake of ornament and shade. They are probably not indigenous to Britain, and are said to have been introduced by Mary, Queen of Scots, and first planted at Holyrood. However this may be, they are a beautiful and characteristic feature of the North. A spreading sycamore overshadows the porch of many a hill country farm, with a trunk as grey with lichen as the limestone cropping out of the slopes around. Sycamore saplings are conspicuous for their angular growth; the branches stick straight out from the stem, and the side twigs straight out from the branches. At this stage of life their bark is smooth. Older trees lose this regularity of growth; their boughs are rather twisted and irregular. The top of the tree is rounded and rather

broad ; often the density of the outer twigs gives it a curious packed or compressed look, as if the air was squeezing it in on every side. The bark of old trees is scaly, and shows a tendency to flake off like that of the London plane.

The sycamore is really a maple, its name being due to a confusion with the wild fig-tree mentioned in the New Testament. The common English maple is more often a shrub than a tree, but sometimes grows to medium height. It usually makes a rather straggling and ill-shaped tree, but sometimes its wayward growth leads it to take some unusually



CORKY BARK OF THE HEDGE-MAPLE

picturesque form. Besides its individual and erratic shapes, its most recognisable feature, at a little distance, is the density of its rounded masses of twigs, which are considerably closer and blacker than those of the beech or elm, and make a great contrast with trees of open growth, such as the ash or black poplar. The hedge-maple, as it is sometimes called, can be identified most easily by its bark, which is reddish in colour, corklike and almost spongy in texture, and ridged and furrowed very deeply. Like the birch and the cherry-tree, the hedge-maple is often garnished with the dark masses of small twigs known as witches' brooms. These may easily be mistaken for large birds' nests. This excessive growth of twigs at a certain spot is most probably due to an injury of

the bough, and may be caused by some wood-boring insect, such as a beetle or gall-fly.

Most trees of the poplar tribe have broad and branching tops, and sparse and open tracery in the smaller twigs. The common black poplar is very conspicuous with its wide head



BLACK POPLAR

formed by several large limbs stretching at an obtuse angle from the main stem, which generally vanishes towards the top of the tree, merging in one or other of its offshoots. This structure is obviously top-heavy and unsafe, and is all the more so for the brittleness of the poplar's white wood. Most large black poplars lose one or more of their main boughs, which leave a shattered fracture and a ragged and

lopsided crown. In large aspens the main stem runs up very high, and the lateral boughs do not diverge until near its top, then forming a rounded head. The bark of these large specimens, as of white poplars or abeles, is usually of a silvery white, but scarred with rough vertical cracks. Aspens also occur as spare, slight trees from twenty to forty feet high, with smooth grey bark. The Lombardy poplar, with its close upright growth, make a remarkable contrast with the broad and rounded outlines of the black poplar, of which it is a variety. No English tree has a more magnificent development of root-buttresses, in proportion to the thickness of the trunk. Its slenderness and great height necessitate these living props to safeguard the great columns of verdure, gazing far across fen and plain.

Willows and alders are often found growing in the same low moist ground as poplars and aspens. The species and varieties of willows are very numerous; but the only common species which reaches the full stature of a tree is the crack willow, with its long, bright green leaves, paler underneath, but not so silvery white as those of some scarcer kinds. This is the willow which is usually pollarded; and pollard willows are even more recognisable in winter than in summer, whether their knobbed heads are close polled, or bushy with the straight stems of several years' growth. When the crack willow is let grow freely in suitable soil, it forms a fine and individual tree. The trunk and the main boughs are massive and free-growing; the boughs have a tendency to sprawl abroad and become top-heavy, like those of the black poplar, but to a much less extent. The frequency with which straggling branches break off in stormy weather has given this willow its special name; but it is a less fragile tree than the poplar, and the freedom of its growth makes it very attractive. The tracery of the branches and outer twigs is very open and

sparse ; and the fine and slender sprays readily distinguish it from other trees of generally similar growth. The bark of mature specimens is marked with narrow and shallow vertical furrows ; and it is one of the most lichenous of trees, the trunk and main limbs being often as heavy as an old apple or hawthorn tree.

Alders are very different, and make a great contrast with willows by many winter streams. They are trees of very various growth ; but the comparative density of the fine, crisped twigs and the abundance of little black seed-cones clinging to them make the alder the blackest of all deciduous trees in winter. These little brittle cones are the female catkins of the previous summer ; they cling to the tree after their scales have parted and set the seed free. Winter parties of redpolls, as well as linnets and several kinds of titmice, are often seen searching among them on the twigs, probably for small insects that creep between the open scales, as well as for lingering seeds. Most small alders, and some large ones—especially when growing close together—have a tall, straight stem, and stiff and comparatively slender horizontal branches. The tree has then rather a weak and uninteresting appearance. But it is curious that many old alders assume a very different growth, and become gnarled of trunk, broad of head, and warped and twisted of bough. Alders of this handsome type are generally found growing in wet meadows or trickling hillside pastures ; but fine specimens are sometimes found by streams. Young trees have smooth grey bark ; but as they grow older it becomes lightly furrowed in an irregular network, and is rather scaly. Most old specimens are well covered with grey lichen.

The birch's graceful lines make it easy to recognise in any group of bare winter trees. Though free-growing, often with two or more main stems, it is always beautifully pro-

portioned in all its parts ; and the delicacy of its long outer twigs is therefore devoid of any suggestion of weakness. For all its sensitive beauty, the birch has the self-contained appearance of a tree which knows well how to hold its own



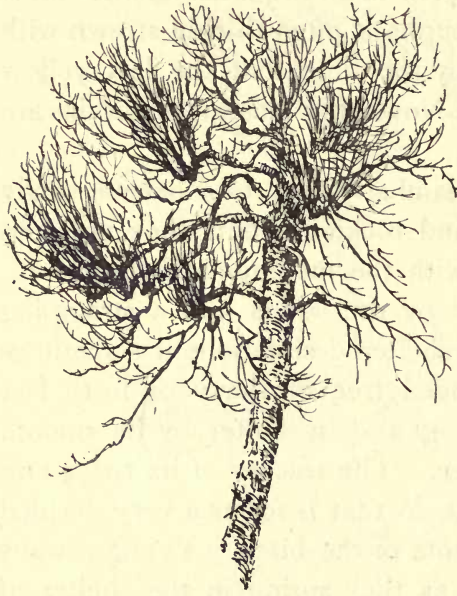
BIRCH

against snow and storm. Next to its graceful growth, its most conspicuous feature is the silvery bark of its trunk and larger branches, which often peels away in transverse strips, showing a layer beneath slightly more tinged with yellow. This yellowness is due to the inner layers being more moist with sap. If we peel off the outer layer before it is quite ready to come away of itself, the inner coating is found of a

pale yellowish-green, which represents a still earlier stage. This silveriness of the bark is not an invariable mark of the birch. In old or weather-beaten specimens, the bark grows split and blackened, and the whole surface covered with dark callous scars. The birch's slender catkins, like the stouter cones of the alder, are much sought in later autumn by linnets and redpolls, which pick them to pieces for the seeds. The ground beneath the boughs is often thickly strewn with the yellowish scales; and by the time that the last yellow leaves have flown down the November blasts, the catkins are usually almost gone.

Birches love a bleak, upland situation, or a barren, sandy soil; and in their higher and rockier haunts they are constantly found in company with the mountain-ash or rowan-tree. Often this is clipped by the winds into a straggling and stunted shrub; but in sheltered situations it sometimes becomes a large and rounded tree of thirty or forty feet high. It is most easily recognised in winter by its smooth and glossy bark of pale grey. The tracery of its twigs and branches is sparse and blunt, so that it forms a very decided contrast with the fine filaments of the birch. Young rowans are often light and graceful, as they spring in the shelter of some Welsh nant or North country clough; but before many winters pass over them the buffeting of the wind makes them one-sided or cramped of growth, and often disproportionately thick in trunk and bough. They run into stout, yet supple curves, which, with the smoothness and colour of the bark, gives the tree an appearance of being built of india-rubber. The rowan has not the birch's power of growing delicate sprays in the teeth of the moorland winds; and its leaves being large and compound, it does not require so abundant a growth of twigs as are necessary for the small leaves of the birch.

The bark of the wild cherry has much the same peculiarities as that of the birch. It is thin, pale and glossy, though less brilliantly silvery; it flakes away in the same transverse strips; and it often becomes split and scarred, showing a dark woody growth. But in general appearance the birch and the wild cherry are very different.



WILD CHERRY WITH WITCHES' BROOMS

The cherry has a variety of growth something like the alder. Most young trees have an upright stem, and stiff horizontal branches; but in old specimens the branches become long and twisted, and the head of the tree takes a broad and rounded outline. With its torn and scarred bark, an old wild cherry-tree has a shaggy and rugged appearance, often increased by the dark and tangled growth of one or two witches' brooms.

The lime and the Spanish chestnut are two trees often found in close neighbourhood in parks and old gardens. In every respect but size they present a marked contrast. The lime is rather the larger of the two, and sometimes becomes very tall when grown in a clump or close avenue. On the other hand, when standing isolated it usually forms a very rounded head, and sometimes attains an immense spread of bough. The sweet or Spanish chestnut is a tree of about the same size as the lime, though it seldom or never grows as tall as the tallest specimens; but it is conspicuous for the

heaviness of its trunk and boughs, whereas the lime has slender boughs, and a trunk no more than proportionate to the total mass. The branches of the lime decrease gradually and evenly to the outer twigs, which are fairly dense, though less abundant than those of the elm or birch. The chestnut's branches dwindle very rapidly, and there is little interval between the large limbs and the leaf-bearing sprays. The limbs are spreading though comparatively short, and are free and picturesque in growth. The bark of young limes is smooth; after the tree reaches full growth it splits into shallow and regular ribs and furrows. Chestnuts have bark strongly grooved in a shallow network, with a wide intervening rib. It is softer in appearance than that of the ash or oak, or most other trees, with parallel rather than flaky sculpture; the ribs and grooves often run obliquely or spirally up the trunk, as is sometimes seen in pines and firs. This is probably due to the unequal development of different sides of the tree during growth. The massiveness and free growth of the sweet chestnut make it a fine tree even in our climate, where it is not quite at home. It is a native, like the walnut, of central and southern Europe; and it grows more freely and abundantly in a characteristic zone of culture midway between the high pine forests of the Alps and Pyrenees and the plain. The horse-chestnut belongs to a different family, and is believed to have come originally from the Balkan peninsula. It is easily distinguishable when bare of leaves and blossoms, owing to its rounded head, the smooth and regular lines of its limbs, the blunt tracery of its outer twigs, and the appearance of the bark. On the trunks of young trees and on the boughs this is smooth and unusually dark. The boles of old trees have grey and scaly bark, something like that of the sycamore, but with thicker and rougher flakes. These three trees well illustrate the different degrees

to which introduced species have acclimatised themselves in our soil. The sweet chestnut grows freely in many woods and plantations, though it is never found very far from where man originally planted it. Limes are very seldom found in outlying woods, and are trees of the park and garden. The horse-chestnut is even more of an exotic; it needs good soil and protection from the coldest and roughest winds, and usually makes a poor and stunted tree when planted in exposed meadows or on shallow and rocky soil. We saw earlier how the common elm abounds in the southern half of England, but has never acclimatised itself in the north. As we learn the lines of the trees in the bare winter landscape, we realise the deep natural harmony between the aspect and exposure of the land and the trees which people it. The first glance at a field or hillside from a train window will show what trees are to be expected in it, and the character of their growth. Lean slopes of the grit-stones and coal measures suggest ill-grown oaks and ashes or (in the south) small spindly elms; deep meadows and gradual hills set us waiting for elms in full majesty above a homestead. White knobs of limestone thrust through turf foretell spreading sycamores by the farm-doors and close hillside pastures sprinkled with dense and hoary whitethorns, which have ten or twelve feet of dwarf stature, and the age of a forest-tree.



BADGER

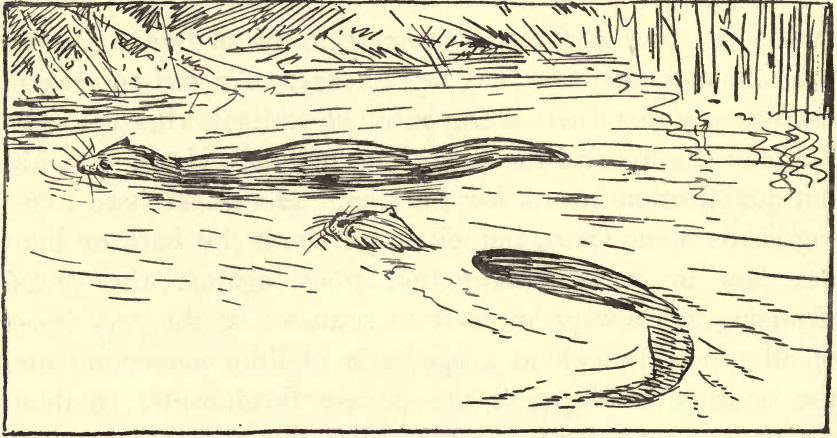
WAYS OF THE HUNTED

AT many, now and again at most forms of hunting, even the robust countryman may feel queasy. An old sportsman used to say that there were only two animals that could be hunted: the fox and the rat. And, indeed, 'Hunting' without qualification means fox hunting. Doubtless hare hunting is the older sport, but either to shoot the hare or hunt her has in it something that goes against the grain. Coursing has always seemed to some of us the very worst of all sports, though as a spectacle of lithe movement and the courage of flight, if the phrase is allowable, nothing equals it. But the hare is too soft and timid to hunt with any pleasure. And how different from the fox! When you watch him move, sly and cautiously, alert to hear any noise, ready to take any cover, yet looking angry as well as cunning—you almost come to believe Jorrocks's breezy conjecture, 'The 'untsmen like it, the 'ounds like it, the 'orses like it, and we don't know as the fox don't like it.'

How all hunted beasts disclose during pursuit their cardinal character: the fox, the otter, the badger, the deer, the hare, the rabbit, the stoat and weasel, and their behaviour 'under fire' is worth some discussion.

The badger, which is a very much commoner animal than most people suppose, behaves in a manner quite peculiarly his own. He is inflexibly courageous and blindly

obstinate. On the coast of South Wales, where the animal is very common, the writer has seen a gang of self-constituted navvies dig a whole afternoon and still fail to penetrate the remotest tunnel of the earth where the badger is digging. On the other hand, he has known the small Sealyham terriers, a hunter much cultivated in Pembrokeshire, draw a badger within a few minutes. For a while the animal shows no fight. It is concerned solely with passive resistance, shrink-



OTTERS SWIMMING

ing from the light almost as sedulously as from the terrier. When put in a bag and carried off it scarcely struggles, but lies, like Brer Rabbit, waiting events. If it is released anywhere near its home—the inference is from badgers caught but not harmed in Pembrokeshire—it makes back to its hole as straight as a homing pigeon, and heeds nothing in the way. On one such occasion two men, who had been left to guard the hole, failed altogether to divert the animal by a yard from its course. It brushed the leg of the man who tried to stop it, and disappeared down the hole in a flash. It had run across two grass fields at an astounding rate, considering the awkward roll of the gait, in which blind

obstinacy was unmistakably expressed. But it is out of keeping in daylight. To view the badger properly you should view it, like fair Melrose, at night. The low scuttle has then a proper furtiveness. You might take the beast for a marauder ; but of all the mammals few do less harm. There is no good reason why it should ever be killed. You could not say this, if economy is a motive for destruction, even for the hare, which indeed is the forester's very worst enemy. It is easier to observe the badger than is commonly thought, for in his almost Mosaic attention to cleanliness, he attends regular resorts, which, when once discovered, may be easily watched.

But he is not a favourite. Fox-hunters do not like him, and many a badger has been dug out because he is supposed to keep foxes away. Nor do keepers like him, for he is supposed to be destructive. It is true enough that he is omnivorous, in the sense that, at certain times and on certain occasions, he will eat anything. But the more we study the food of animals, at any rate of the larger mammals, the more clearly it appears that they will vary their diet indefinitely under the pressure of circumstance. The writer has absolute evidence that the brown squirrel, as a rule most harmless and dainty of animals, will eat young birds ; will indeed climb to the rookery on purpose to feed on them. The grey squirrel is worse. It has recently become a naturalised English mammal. The Park that is sanctuary and zoo at Woburn was full of them, but the Duke of Bedford found them so destructive of other animals that he was forced to their destruction. In America, their native home, opinions differ about their character. The writer was once walking round the beautiful zoo at the Bronx Park outside New York, in company with one of the directors. The grey squirrels were seen in all the open parts and were given

a good character. We were assured that they were in no degree dangerous to the birds. The assurance, however, had hardly been given, when one of the party saw a squirrel with a sparrow in his mouth. This was taken as evidence that the numbers had grown excessive, and that evening orders were given for the destruction of some of them. It will soon be necessary to reduce the number in Regent's Park, where they are rapidly destroying all the nests of the blackbirds and thrushes. The hedgehog, again, will eat anything, from a young partridge to a seedling wallflower. The badger has various tastes in the same manner. He will kill a maimed or sleepy pheasant. He will even kill and eat a young lamb. He will destroy eggs. But his crimes are rare, as with the squirrel, and perhaps the hedgehog. The harm he does is always too small to give any excuse for destruction.

Among the animals which we call vermin, the most noticeable quality is courage, deliberate courage, which, when the beast flies, is expressed in control. The writer has seen it, in remarkable instances, in both the stoat and weasel. An attempt was made to bolt a stoat from a rabbit hole which he had been seen to enter. Directly the ferret, a very big albino, was put in the burrow, the stoat came to the mouth of the hole, and looking round at a dangerous, if not alarming company of men and dogs, retreated to face the smaller risk inside. In the underground fight he won, and drove back the ferret. The albino was then supported by some polecat ferrets of perhaps greater courage if less bulk. The stoat again came to the bolt-hole entrance, took a quite calm look round, and again retreated; but a quarter of a minute later shot out of the hole straight to the very thickest bunch of thorn outside, moving with such impetus that none of the terriers, though they saw him come out, ever came

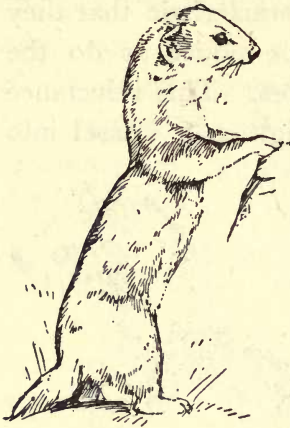
even near him. The quickest keeper could scarcely have shot the stoat in time. No Dumas musketeer could have more coolly and courageously thought out and carried out his ways of escape than that buck stoat ; and the behaviour is normal to the species. It is also characteristic that they dislike skulking or lying low to escape notice as do the timid creatures, such as rabbits and hares. This reluctance may lead to their undoing. If you frighten a weasel into any cover, such as a heap of faggots, you may know for certain that he will not stay there long. As surely as a rabbit which took sanctuary would stay in it, so surely would a weasel leave it at the first opportunity. You have only to sit still and watch.

The strangest and most thrilling feat that the writer ever saw was the escape of a hunted weasel. It appeared from a grating close by the wall of a beautiful sixteenth-century house of red brick. The age and material of the building are pertinent to the issue of the story. The animal had come forward very little way when his retreat was cut off by a party issuing from a door just by the grating. They were armed with nothing more alarming than tennis balls and tennis racquets, but these were weapons enough. The weasel at once made for the wall of the house where it jutted out on the side remote from the door. He ran up a climbing rose-tree, but on reaching the top, where he stayed a moment, he found himself still within reach of the racquets. The only way of



WEASEL

effective flight was straight up the wall ; and he took it. With his body very close and legs wide he clambered up without great difficulty until he came to an old window that had been filled up with newer brick.



On this the claws could hardly grip, and as he attempted it, three feet slipped altogether and a fall was only prevented by a single claw. The weasel, now about thirty feet from the ground, stopped still, perhaps intending to wait till the enemy had departed. But one of them, less kind than the rest, began to throw tennis balls at the clinging beast. Again he had only one safe alternative, and took the venture. At this attempt he crossed

the danger zone successfully, and going very quickly over the last stage, disappeared into a gutter running along the roof. The athleticism of the escape astonished us at first, but the brick was old and well pitted. It may be that in the chronicles of the weasel's accomplishments it would not reach very high.

But as one thought over the stages of the flight, its reasoned pauses and determined rushes, one was most astonished by the cool courage, the deliberate calculation of odds at a crisis.



The animals are vermin when they hunt, but they deserve a more heroic word when they fly.

In one sense, nearly all animals are brave : they bear pain well, or, if the description is preferred, their nervous system is not sensitive enough to suffer. A rabbit with

a broken leg will run at great speed for 60 or 80 yards; and then, if there is no pursuit, stop and begin barking a twig, as if nothing had intervened to interrupt the ordinary feeding hour. Sometimes, of course, they are dazed by a sort of terror; and doubtless both rabbits and birds are charmed by stoats as no creature is by a snake. One astounding instance of the numbing of all the initiative faculties of a rabbit deserves to be recorded. The rabbit pursued by a stoat ran to the very feet of the onlooker and there crouched. It allowed itself to be lifted and carried into the house, showing no fear, and no relief. Sense seemed numb. It was clearly unhurt physically; but when set down within the house made no sort of effort either to run away or to frisk. The same utter lethargy of mind and body remained when it was taken on to the lawn. No exact time was taken, but it was afterwards estimated that at any rate more than an hour elapsed before the rabbit showed sign of normal alertness and fear. Then it ran off into the bushes as a wild rabbit should. The stoat will not always terrify the rabbit out of its self-control; and in defence of its young the doe rabbit discovers a courage that is peculiar to the maternal sense. She will drive off even a stoat, and limbs hardened to a wonderful temper by burrowing practice become sufficiently terrible weapons. It is courage of a more patient sort which enables a rabbit to endure, it may be for hours, the attack of a ferret from the rear. Many a rabbit has saved itself by shoving up to the narrow end of a blind alley in the hole; and not even running the risk of a kick while the ferret scrabbles vainly at its quarters. The hare or rabbit in its form shows similar fortitude. How often walking through the crackling stems of the dried kex in an open spinney, one has seen a rabbit lying low, so close that you may almost touch it, and may easily strike it. On

such occasions even a dog with a good nose will pass close without noticing. But the moment there is a vestige of a sign that the hiding-place is observed, you see just a glint of the eye which has been stock still, and the rabbit is off at a pace that few animals can equal at their start. The rabbit thus shows peculiar presence of mind within its own surroundings ; and it is a question whether any mammal has equal skill in giving the alarm. The note is singularly appropriate to the occasion. If you step up noisily to some bracken or to a spinney where rabbits are out, you will not be vouchsafed any sign, except perhaps a scamper. The noise is such that no further warning is necessary. But if you can creep without notice to such a point of vantage before making your experiment, the rabbit behaves very differently. One has often tested them. From your hiding flick a gravel stone or scrape a stick or make any other slight and non-human noise. It is odds that the movement in the bracken ceases. Repeat it, and you may expect to hear the thud of a rabbit's foot striking the earth hard. Its effect on other rabbits is not quite instantaneous. But within a few seconds you see the rabbits which are out in the open stop feeding ; and then turn head to the spinney, so crouching for a while. A few may recover courage and presently continue to feed ; but what happens times without number is, that one by one they all slip back into the wood slowly and quietly. 'It is best to be on the safe side.' 'He is a good sound watchman and would not "start a hare"'—such seems to be the attitude. Clever and quick though the rabbit is within his own domain, he is easily flurried and seems to lose instinct if removed a very little way off. If you catch a rabbit in a net—a very easy thing to do—and take it even to the next field, it is quite astray. It will run to the first cover it sees, in a rather undecided way, but when

there appears to have little idea of any course to follow, and is, as a rule, easily caught. For the rabbit is a stay-at-home, venturing very little way from his burrow, except in the evening or under stress of food. During a time of deep snow, they will travel quite a long way to find where the snow is drifted up against ash saplings; and so a platform is provided for their meal off the tenderer bark. Many people have been puzzled when the snow is gone, to account for these barked places high above the ground.

No form of the hunt has more spectacular attractions to the multitude; and yet none, at least as it appears to some of us, is less endurable than coursing.

The hare appears to have been developed on purpose to escape the greyhound. The eyes are set back so that without turn of the head a full sight is obtained of the pursuer. If you stand still



a hare, blind to things immediately in front, will run right up to your feet, but there is no approaching a hare from the back or either side. The eyes are made for flight; and if you could regard the sport without other feelings as an athletic feat, the jink or quick turn of hare at the last possible moment would thrill you with admiration. It is timed with perfect precision, and is so rhythmic that it seems part of the natural paces. But Darwinian nature works more slowly than the fancier, and the pursuer has been developed to a perfection that leaves the pursued almost helpless. No sight is more heartrending than the vain exercise of their supreme turn and 'bends.' Atalanta's suitors had as poor a chance and were as ruthlessly slaughtered. Except in good grass country not one hare in a score escapes; and the uncomely

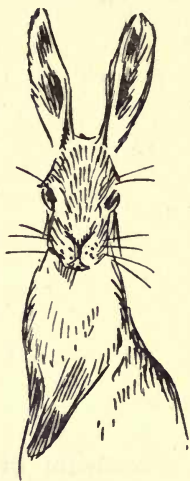
crowds which flock the outer fields to see the sport, rejoice, and will, if they get the chance, head the hare and hound it back. It is common for the animal to make for the line of people. This may be due to the accident of blind terror; but the incidents are so many in which animals, especially hares, have, in extreme, turned for protection to men, that one wonders if in the coursery field, too, this instinct does not work.

Mr. Thompson Seton, best of all the transatlantic naturalists, once gave the writer a strange example of this trust in man as a last resource. He was out on the snow in the North-West looking for ermine. In the course of his journey he saw a white hare pursued over the snow by a white ermine; and the hunt was near its tragic end. But in the hunted hare there was just enough initiative and sense left to take a last chance. She ran straight to Mr. Seton, and squatted between his legs. The white ermine, cool and collected as ever, stopped to watch the manœuvre, circled twice round the man and hare, decided that the chance was past, and made off. In a minute the hare recovered and hopped away quietly, shy again of the man, but not frightened.

A hare is almost like a bee in one thing. It cannot endure any quick movement in man. Stand still and it loses fear. Even if it sees it is not alarmed. When pressed even in a slight degree the hare will take to water like the stag. The writer has known a hare land at his feet across a wide and rapid brook. It took to the water without any sort of hesitation and swam strongly and easily. It was entirely undistressed on landing, and did not even shake itself, though the pursuit, such as it was, had hardly come into sight, and was no more than a strolling labourer.

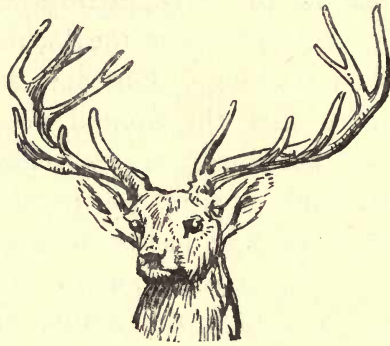
Preservation is usually attained by shyness, by intense

wariness, but no hare, or indeed any animal in England, can approach the red deer in that quality. It seems to have learned by inheritance the signs of man's approach, for man is its only enemy in England. Some of the hardest and most skilled of sportsmen who hire the same deer forest in Scotland year after year, and know the land to perfection, are wholly unable, even with the most perfect of modern weapons, to circumvent them. They have to rely largely on the gillie, who is as much at home in the so-called forest as the deer themselves; and the sportsmen readily confess the barrenness of their solitary stalking. The deer has almost every quality that the hunted need; an acute nose, an acute ear, a marvellous power of speed; and greater power than would be suspected by any visitor to a zoo of suiting himself to his environment. The hunter must know not only the nature and habits of the quarry and the lie of the ground. He must know even the course of air currents and eddies, even the echoes of the hill. But like many animals the deer is not always well served by his eyes. Sounds and smells seem to satisfy curiosity, to convey knowledge that is complete or complete enough to suggest flight. The eyes, on the other hand, stir curiosity; and the hunter can use this curiosity. Lying in sight of a deer, he sees that further approach is useless. Any advance would certainly mean discovery. He has waited in vain for the animal to move of its own wayward will. His only hope is to make the animal restless but not fearful. Under such conditions, it is not an infrequent device of the stalker to flip pieces of moss up into the air from his hiding-place. Such a sight is new in the



animal's experience. He stares with a sort of fascination, as deer hunted at night in America will stare at a bright light. It is unlikely that he will actually approach the spot, but he will rise and reconnoitre, and in so doing, it may be, serve the hunter's purpose.

The stalker, who flips the bits of moss, is using much the same device as the stoat which plays its gymnastic antics. It is certainly a common trick of the stoat's, though perhaps not general, to tumble head over heels, to indulge in a

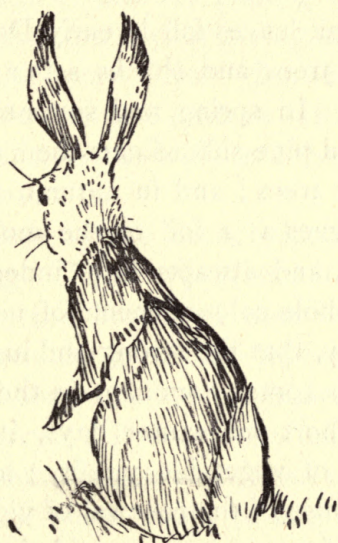


RED DEER

succession of queer leaps and dances before the spectators whom he desires as victims. While the display is in progress birds will come round and venture quite close, solely, one would say, from a sort of fascinated curiosity. Among very many animals the eye is the most easily deceived of the senses. They do not see still things, and apparently they do not distinguish the form or meaning of any moving things. Seeing is not believing. Smelling or hearing are. The faintest whiff of man's presence down the wind will send the deer flying for miles; that worst enemy of the stalker, the old cock grouse, has trumpeted danger to hundreds of deer, whose watchman he is.

For perfection of all the senses, especially of sight, one

must leave the ground animals, whose eyes are made for near things, and watch the golden eagles, which are becoming quite a common herd since the deer forests have spread. They find in the 'forests' the quiet and protection they demand; and carry in safety to their protected eyries the grouse and rabbits and hares which are their proper prey.





DAYS OF THE EVERGREEN

WHEN the last oak leaves fall in early December, the foliage of the evergreen trees and shrubs sets a new note of colour in the landscape. In spring and summer the dark tones of holly and yew and pine subordinate them to the gayer verdure of the deciduous trees; and in autumn the deep evergreen foliage chiefly serves as a foil to the more splendid hues of the dying leaves, and attracts little independent notice. It is not until the whole colour-scheme of nature is subdued to its winter delicacy, that the strong and lustrous beauty of the evergreen trees becomes dominant in the woods and hedgerows. In the short midwinter days, it is the most conspicuous feature of vegetable vitality; and it stands as an emblem and promise of the renewal of vigour in spring.

The beauty of evergreens at midwinter is perhaps seen best of all in tracts of mixed and open woodland, where clumps of well-grown hollies are scattered among beeches and other deciduous trees. At other seasons the hollies seem obscure and gloomy; now they stand forth in the winter light with a depth and brilliancy of verdure which is partly due to the subdued tones of the surrounding vegetation in its winter phases, and partly to the innumerable reflections from the facets of their glossy leaves. The eye is now able to appreciate, far better than in spring or summer, the essential

vitality of their dark, yet vivid verdure, and the aspect of health and vigour which shines in them from root to topmost twig. Where at other seasons they form part of the unconsidered background, they are now the centre of the picture. Their mass of deep green foliage forms a striking contrast with the grey and silver of the beech trunks, the black arms of the interlacing oaks, the delicate russet of withered bracken, and the faded tussocks of heather and ling. In years when their berries are abundant, their beauty is greatly increased by the scarlet clusters shining in the winter sunlight against the pale blue sky, or giving a welcome touch of bright colour on the grey days. But the beauty of the berries is largely due to the contrast with the deep green leaves; and even a berryless holly is a beautiful tree in its mature winter vigour.

Hollies shed their leaves about midsummer, when they have done flowering. Their appearance from spring to mid-autumn is less lusty and burnished than in winter, owing to the contrast between the tarnished leaves about to fall and the young green shoots, and the gradual development from blossom to ripe berry. All evergreen leaves have a tough, smooth surface, which protects them from cold, and prevents the free transpiration which would be fatal to them when the roots ceased to supply them with an active flow of moisture in winter. This toughness makes them far more durable than the leaves of deciduous trees; and in the case of the holly in England, the leaves often last for four years. As only a quarter, or less than a quarter, of the leaves drop in any one season, the tree is always well clothed, and is fairly called an evergreen. Decay comes very slowly after they fall; and it is usually at least two years before they are completely skeletonised. The prickles on the leaves are formed by points of the tough marginal thread, which resists decay

even after the inner veins and most of the lateral ribs have disappeared ; and even after the leaves are two-thirds rotted, they provide substantial nesting material for the thrushes and blackbirds which so often build in hollies. The close clusters of greenish-white flowers are usually almost overlooked amid the profuse blossoms of early summer ; and we do not think of the holly as a flowering shrub, as we probably should if it blossomed in autumn, like the ivy, or very early in the year, like the garden laurustinus.

The holly is one of the most typically English of all our trees, and deservedly holds the first place among the ever-greens which we associate with Christmas-time. Though it bears up well enough against our English winters, it does not like the dry air and severe frosts of continental climates. It is scarce in central Europe ; and its place in Christmas festivities is taken in Germany by the silver fir, which has exactly opposite tastes, and does not flourish very well when planted in England, because of the dampness. In the forests of the Jura mountains in Switzerland, which are chiefly composed of beech, and have a characteristically English appearance as compared with those of the Alps, the holly is one of the rarer shrubs. Where it grows in the outskirts of a village, it is sometimes chosen as an appropriate shelter for a way-side crucifix ; for the people still remember the tradition, now almost obsolete in England, that the Cross was made of holly wood, and that the red berries represent the drops of blood. But although the commonness of the tree in our own country has contributed to the disappearance of this old belief, there is still a marked distinction between the associations of the holly and those of the mistletoe. Holly is felt to be in keeping with Christmas on its sacred side ; while mistletoe is more purely secular. This distinction is no mere modern convention, but is a survival from very ancient times. The

decoration of our homes and churches with evergreens at Christmas was handed on from the old pagan rejoicings at the winter solstice, when the sun began to rise from his long descent, and the evergreen leaves were used to symbolise his unconquered vitality. But while the holly was retained without offence as a token of the same message of hope in the Christian festival which superseded the pagan feast,



MISTLETOE

mistletoe was specially associated with the evil features of Druid rites. The tradition of kissing under the mistletoe is the last reflection of the savage orgy which accompanied the midwinter feast of Druid sun-worship.

Mistletoe and not holly or any other evergreen was no doubt given a special prominence in the rites of England in old days, because of its singular parasitic growth. It is the most conspicuous of all such evergreen symbols of natural vitality, gleaming as it does on the bare winter boughs. In Germany, where it is surrounded with none of our own

associations, mistletoe sometimes grows on the Scots fir; but in England its effect is seldom, if ever, impaired in this way, and the evergreen does not grow on an evergreen. It is commonest on apple-trees, but also grows frequently on limes, hawthorns, black poplars and maples, and much less often on several other trees. The likeliest place to find mistletoe bushes on an unusual host such as an ash or willow, is in the hedges of large orchards where the apple-trees are full of them. On oaks it is exceedingly rare, which is probably the reason why it was venerated in this situation by the Druids. Sometimes the seeds from the ripe berries may fall on lower boughs of the same tree, and give rise to other plants; but birds are the usual means of distribution, especially the missel or mistletoe thrush, which is fond of the soft gelatinous berries, and begins to haunt orchards for nesting in the early spring when they grow fully ripe. At Christmas they are only just ripening, as can often be seen by their tinge of green. The plant generally shoots from the under side of a bough, as the seed tends to get washed down to this position, and is better protected. Mistletoe plants are true parasites; they do not merely lodge on the trees and drink the air, like many exotic orchids, nor simply cling for support like ivy, but pierce the bark with their roots, and subsist on the juices of the tree. They thus tend to weaken it, and to lessen the crop in the case of apple-trees, but there is seldom a very heavy growth of mistletoe on an apple-tree until it has reached an age when its productivity begins to decrease in any case.

Nowadays the common associations of the yew are very different from those of the holly and mistletoe; they are sepulchral rather than festive, pointing not to immortality but to decay. But in spite of the sombreness of its boughs it is doubtful whether this was the original significance of the

choice of the yew for a graveyard tree. Though yew boughs do not glitter cheerfully like those of the holly, and its berries are far less bright, a yew on a winter day has an even more striking suggestion of unconquerable vitality. The life which its dark boughs and massive trunks suggest may be sombre, but it is tremendously stubborn and enduring. The slow growth and great longevity of the yew add to the same impression. Very probably it was life and not death that



YEW IN SELBORNE CHURCHYARD

yews suggested to our unknown forerunners who first planted them by their dead ; for the vitality of an old yew growing away from churchyards on the chalk hillside is far more conspicuous than its gloom. Yews are sometimes said to have been planted in churchyards to provide a parish supply of wood for bows. If this was ever an object it was probably a subsequent and additional one ; the original association with the spot seems far more likely to have been based on its evergreen symbolism.

The great age often reached by the yew is closely con-

nected with its exceptionally slow growth, and its tolerance of shade. Yew-trees will grow in the shadow of deep woods, though they do not actually require such dark and cool situations, like many ferns. But the absence of sunlight in these recesses prevents them from adding rapidly either to their length or girth; and the forces of vitality, being so sparingly expended, may be prolonged for many centuries. The age of none of the oldest yews in Britain is accurately known, for they outrun all trustworthy records; and it is impossible to tell the age of an old felled yew by counting the rings in the wood, as additional rings are formed by the enclosure of lateral shoots. The hollow trunk of many old specimens is swollen and ribbed into curious shapes, as is the case with many other old trees; but the ribbed shell of some old yews may not be the original trunk at all, but the amalgamated stems of young suckers which have sprouted from the roots and the lower part of the trunk, and eventually encased and concealed it. A thick growth of such suckers is common in the case of comparatively young trees, though some grow with a clean stem. The leaves, like those of other evergreens, last for several years—it is said for as many as eight; and their scanty downfall combines with the thick shade to keep the earth beneath a clump of yews extraordinarily naked and desolate. Even the scanty brambles which straggle about the floor of dry leaves in a beech-wood are absent from the black earth of a thick grove of yews. Birds habitually avoid the darkest woods, partly, as it seems, from mere distaste at their mouldering dankness, but partly because they foster comparatively little insect life. Occasionally a titmouse can be heard cracking one of the hard yew-seeds, by taking it in its bill, and hammering it repeatedly on a bough; but often the stillness is complete.

Yew-berries ripen in early autumn, when the hard green

seed is half hidden in a rosy gelatinous cup. This red jelly is covered with a delicate bloom, like a plum, and is sweet and rather pleasant to the taste. It is one of the fruits of which missel-thrushes are exceedingly fond. The enclosed seed contains the same alkaloid poison found in the leaves, so that yew-berries have been prudently included among poisonous berries in popular estimation, though the outer pulp is harmless enough. The poisonous effect of the leaves on horses, cattle and sheep is very erratic, and is not fully understood. Sometimes the leaves prove very fatal, while at other times the animals eat them without harm. It has sometimes been held that cattle only suffer from eating the leaves when they have been cut, and are withered and prickly; and that the fatal effect is not due to chemical poisoning, but to mechanical irritation. But the effects seem just as uncertain in the case of cut leaves. The evidence tends generally to show that animals may often gnaw small quantities of the foliage of yews growing just within their reach without harm, but that the mischief follows a heavy gorge, when clippings or cut boughs are left in their field, or they break their way into a wood or garden where there are abundant bushes or low boughs.

Ivy, like holly, gains a new brilliance of verdure in the subdued winter landscapes. When the leaves have fallen, the massive ivy bushes hanging in the heads of the hawthorns and crab-apple trees, or clustering round the limbs of elm or ash, gleam with a sober but vivid brightness among the bare boughs above the carpet of withered leaves. Like mistletoe, ivy shows the true evergreen spirit by bearing its berries at midwinter; and they form the favourite food of the wood-pigeons in hard weather. On frosty days in December and January there is the same heightening of colour in the blue wings of the pigeons clapping out at the ring of our feet as in

the green crown from which they fly. The pigeon's plumage is as pure and delicate in May, but it does not catch the eye with its beauty in the same way when it flies out from the tender luxuriance of spring verdure. Deeply satisfying as is the colour of a bushy crown of ivy, there is more individual beauty in the leaves on the climbing stems. Like the holly the ivy changes the shape of its leaves as the plant grows mature ; just as the holly loses most of its prickles, keeping only a sharp terminal point, the many-pointed leaves of the climbing ivy-spray change to a rounder outline as the end of the journey is reached, and the plant spreads into a bush. The leaves on a climbing or creeping stem are of a darker and more beautifully mottled green ; it is shot with a purplish bloom, and the veins are traced in buff and creamy white. This change in the ivy leaves makes us wonder whether the familiar protective explanation of the prickles of the holly is valid after all. Prickles—so it is claimed—have been acquired by the holly-tree so as to guard it in lowly youth from being destroyed by grazing animals. When the tree grows out of the reach of all beasts found in its haunts, it ceases to need its armour, and the leaves lose every prickle but one. According to the same theory, we ought either to regard the jagged outline of the leaves of the young ivy as a protective armament in the making, or possibly in decay, or else we must regard the resemblance as purely fortuitous and unmeaning. But the holly and ivy are so alike in this respect that it is difficult to believe that they are not examples of the same principle. And if we can find no protective significance in the ivy's harmless points, there is a strong suggestion that protection may have less to do than we thought with the development of the sterner prickles of the holly.

Ivy clings to the earth, trunk or wall, on which it creeps

by a fringe of rootlets which perform a double function. They hold the stem firmly to its support, and they suck up moisture, and help to nourish the plant. A stem of ivy, growing on a wall facing a bank of earth, sometimes continues to flourish for many years, even when it is severed from the root. The moisture supplied by the lateral rootlets in such a damp situation is sufficient to keep it vigorous. Even when growing on a tree-trunk, a stem of ivy will sometimes obstinately resist execution in the same way for a year or two, though it seldom holds out longer. Trees with soft and deeply furrowed bark, such as elms, provide the rootlets with more sustenance in this way than smooth-barked trees, such as beeches or sycamores. A thick growth of ivy is undoubtedly harmful to the supporting tree, both by constricting its growth and fouling and choking the bark. In most cases it is also injurious to old masonry, by splitting it asunder with its intrusive stems, and overbalancing it with its heavy crowns. In some instances, however, it grows so as positively to compact and strengthen the wall it embraces; and it need not be condemned without a careful examination. Old ivy-bushes topping ruined walls make wonderful nurseries of wild life. They are refuges for the owl and bat by day, and for the dove and daw, and a multitude of smaller birds by night. Even the fox will sometimes scramble into their crown, and lie warm in the evergreen cover.

Firs and pines have never been natives of England in historic times, though there are still some grand specimens in a few Scots forests; and thus in this country no such ancient Christmas associations cling to the fir as in Germany, though our adoption of the German Christmas-tree has begun to implant them. But plantations of Scots pine and spruce fir now cover so many thousand acres in Britain, and clumps and isolated trees of both species stand so conspicu-

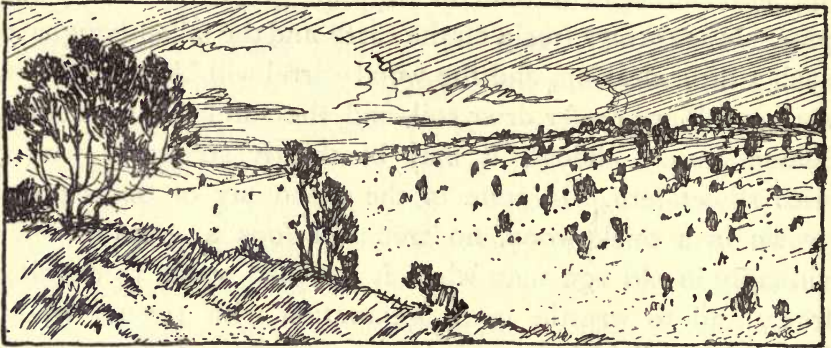
ously on a thousand hills, that they have won a true place among English evergreens. Though the whole of this family of conifers is known as pines, within the family, firs are distinguished from pines proper by the separate growth of the needles, whereas pine-needles grow in tufts; and it is thus strictly correct to speak of the Scots pine, and not of the Scots fir. The little bunches of needles are a conspicuous feature of the boughs of an old pine, and help to give it its clouded and mottled effect as seen against the sky. The needles of the spruce fir are solitary, and are arranged in a regular spiral on the twigs; and this arrangement, in addition to their comparative shortness and bluntness, makes a young spruce the stiffest and primmest of all the evergreens, and also makes it the most convenient of little shrubs for decoration as a Christmas-tree. In the silver fir, the needles stand out flatly on each side of the spray, like the leaves of the yew—which are themselves almost needles; and in the Austrian pine, which is the commonest conifer in plantations next to the Scots pine and spruce and larch, the needles are borne in pairs as in the Scots pine. But the greater length of the needles, and the denser growth of the tufts, makes an Austrian pine so much coarser and blacker to the eye that it is easily distinguished. In the Corsican pine, which is another variety of the Austrian, this blackness and density are less conspicuous; but the Corsican pine, like the Weymouth pine, with its large cones, so apt for Christmas fires, begins to lead us away from the heath and open woodland into the garden of exotics.

Old spruces lose most of the primness and stiffness of their youth, and sweep the ground with heavy down-curving plumes which have a wild and melancholy beauty. Spruces stand a wet soil better than the Scots pine or larch, and are

often planted in damp hollows of woods, or in other hollows which they make into woods later on. The gloomy ornaments of old-fashioned hearses were copied from the drooping branches of the spruce; and the darkness and silence underneath them are the heaviest in all the woods, except only under dense yew boughs. But where the sunlight can strike to the ground athwart their many upstretched fingers, they are by no means a gloomy tree on a bright day. Their foliage is of a distinct yellow-green, with a brighter and more springlike tone in it than in the blue-green needles of the pine. Moss grows freely on the earth and the fallen boughs in such a little clearing, and the wood-sorrel will bloom there in spring. Pines prefer drier soil, and the soil beneath them is seldom mossy, though it may be thickly strewn in winter with russet fern. In spite of the monotony of Scots pines grown in a thick wood, no tree develops a grander individuality in old age than when it has had space to develop freely and to wrestle for a generation with strong winds. Probably no British tree combines strength and picturesqueness quite so perfectly as an ancient pine. Its trunk is like a tower, the spring of its boughs seems to wrestle against all the winds, and yet it is fledged with foliage as light as wandering clouds.

There is the same wild beauty on a far smaller scale in the least of the pines of Britain—the common juniper. The juniper will grow on most soils; but it is far commonest on unploughed chalk downs and commons on a chalky soil. On the bare downs it generally forms a small bush, three or four feet high, except where it finds shelter from the wind among other shrubs, when it grows occasionally to fifteen or twenty feet. In bleak situations its boughs are dwarfed and blown over by the prevailing wind, and its gnarled and lichened stems wrought by straining with the blast, like those of the

hill-top pines. Some steep slopes of the downs are as thickly dappled with juniper-bushes as a mackerel sky with clouds; and when the white sheep go roaming among their dark and motionless heads, they appear from a distance like clouds fallen among them. Junipers in sheltered places form tall bushes of graceful and curious outline, sometimes with the columnar growth of the cypress, and sometimes recalling the freakish shapes of the clipped yews in old-fashioned gardens. The dark-green needles have a hoary bloom, especially when



JUNIPER-TREES ON THE CHALK DOWN

young, which gives a peculiar grace and freshness to the foliage; and the delicate contrast of colours is heightened by the silver lichens studding the stringy, red bark. The berries remain green for the first year, and then turn slaty-blue, with a grey bloom like that of the young foliage. Junipers are seldom found except on ancient turf that has never been disturbed with spade or plough. They are relics of primeval nature, rare and very interesting in a land where man's traces are so deeply graven.

The box-tree is one of the scarcest of wild British ever-greens, though it is so familiar in gardens. It is now confined in a wild state to a few woods on chalk or oolitic limestone, such as the well-known groves at Box Hill in the

Surrey Downs, some thickets in Chequers Park in the Chiltern Hills, and a wood at Boxwell in the Gloucestershire Cotswolds. Its glossy foliage is distinctly lighter than that of the holly and most other evergreens; and the verdure of a clump of boxes is doubly cheerful on grey winter days, when the turf is clouded with rime. Furze and broom are as common as the box is rare; and the furze more than redeems



BUTCHER'S BROOM

the sombreness of its needles in midwinter by its occasional gleams of bloom. The butcher's broom, or knee-holly, is a curious little evergreen bush which, like many of the scarcer shrubs, is most frequently found on a chalk soil. Its stiff, sharp-pointed leaves add rather to the interest than to the colour of the woods where it grows, for its green is dull and uniform; and though it has brilliant scarlet berries springing curiously from the middle of the leaves, they are seldom numerous enough to make any show. Butchers formerly used its stiff sprays for sweeping their blocks; while its

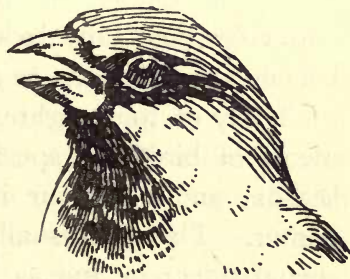
height and prickliness explain its name of knee-holly. Brakes and hedgerows on chalk soil are also the chief home of the privet. Privet in a wild state is but a half-hearted evergreen. It is often not much more thickly clothed with leaves at mid-winter than the bramble, which is half-evergreen in our mild English winters. Privet leaves last through the winter in better heart and colour than the stained and tattered bramble sprays; but they have little of the glistening luxuriance at Christmas-time which distinguishes the true evergreens.





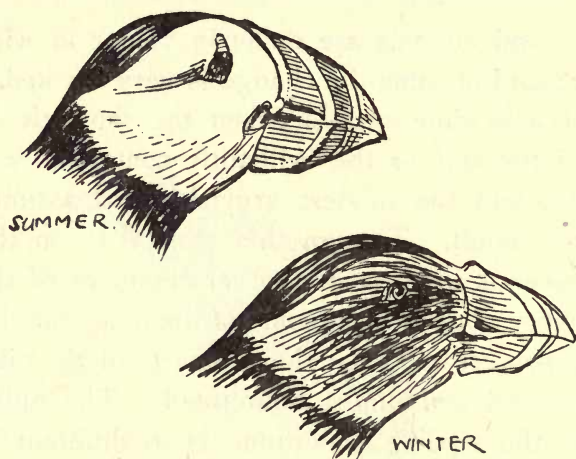
WINTER DRESS

Most birds and animals are duller in colour in winter than in summer ; and in some the change is very marked. There is a remarkable difference between the fantastic breeding plumage of the ruff, or the brilliantly contrasted colours of the dotterel, and the modest greyish dress assumed after the summer moult. Though this change is on the whole most conspicuous in these and other members of the wader tribe, it is very noticeable in some of the most familiar birds. Cock house-sparrows lose their smart black bib, which becomes blurred and almost obliterated. The dull spotted plumage of the starling in autumn is so different from the metallic gloss of its spring plumage that birds in this phase are often not recognised by eyes that know them when they are busy with their young. The brilliance of the cock chaffinch's varied colours as spring approaches makes it a far finer bird than in autumn ; and there is an increase of freshness and brightness in the markings even of such modestly dressed species as the hedge-sparrow and coot. The change extends in some cases from the feathers to the hornier and fleshier parts ; the grotesque striped sheath which



SPARROW WITH BLACK BIB

swells the puffin's beak in the breeding-season vanishes after the moult, together with the wattle-like protuberances round the eye, and the rough red skin of the face. In all their typical cases, the dress in spring and early summer is more brilliant and elaborate than the winter plumage. In many animals there is a similar, though less marked, fading of summer hues as winter comes in. The winter coat of deer, hares, polecats and martens, and several kinds of mice



and voles, loses the reddish or tawny hues of summer and becomes a duller dun or grey.

Many of the brightest colours and most elaborate ornaments of birds are special accompaniments of the nesting-season, and disappear in the idle months of autumn and winter. They are usually explained as being the results of sexual selection, and as having been produced by perpetual breeding from the stocks which most pleased the eyes of the hen birds. In winter, when courtship loses its importance, protective adaptation to some extent takes its place in controlling the colours of birds' plumage and animals' pelts. Though there is nothing very closely imitative of its sur-

roundings in the greyish winter coat of a hart or a hare, on the whole it is more in accordance with the faded vegetation and the subdued light than the redder summer dress would be.

A far more complete and striking change of colour is that of those animals and birds which put on a winter dress of white. The commonest of them is the stoat, which in winter becomes the ermine, and provides the well-known white skin flecked with the black tuft on the end of the tail.



A NEARLY WHITE STOAT

The market is supplied with ermine skins from Russia and northern Canada, where stoats abound and the winter change of colour is universal. Britain lies in regions of a more temperate winter climate, and the consequent modification of the stoat's change of colour is very curious. In Scotland the complete white winter dress is common, and in the south of England it is rare. Between the two, over the greater part of England, stoats are often found in winter with irregularly blotched skins of summer red and winter white, while many do not adopt the winter dress at all, and a few are found with it complete. Ireland has a well-marked race of stoats of its own, which are usually distinguished as a separate species; and these are said never to turn white, owing to the greater mildness of the Irish climate. Besides the normal influence of geographical position and climate,

the mildness or severity of each individual season has a powerful effect in deciding whether these little creatures shall be plain stoats in winter or ermines. White or partly white specimens are much commoner in hard winters than in mild ones. Even weasels occasionally become partly white in spells of frost and snow; but no cold weather can change a weasel into an ermine, because the weasel has no black tuft on its tail, and therefore lacks the ermine's essential feature. To the gamekeeper stoats are always vermin, whether they are ermines or not; and it might be thought that the two words are really the same. But the resemblance comes by chance; ermine is the English form of an old name for several such small fur-bearing beasts, while vermin is derived from the Latin *vermis*, a worm, and came to be applied to small unpleasant creatures in general.

The only other British quadruped which turns white in winter is the mountain hare. This is a northern and Alpine species, which spreads as far south as Scotland and Ireland, but is not found in England. In summer it is grey, and it is therefore often known as the grey or blue hare; but in winter it turns pure white, except for the black tips to the ears. In Ireland it keeps its grey coat all the year round; and this is very illustrative of the position of our islands just on the boundary-line of these winter changes proper to a severe northern climate. It haunts the mountains and high moors in summer, but descends to the lower slopes in winter, like the grouse and deer which share its home. As with the stoat, the character of the weather has a powerful influence on its change of colour. In mild autumns it changes much later than in cold ones.

In Britain we have no Polar bears or white snow-foxes to help make up a really representative Arctic fauna; but the summits of some of the highest Scottish mountains still

provide a breeding-place for the ptarmigan. Formerly the ptarmigan bred on the mountains of the Lake District, and probably also in Wales. In its summer plumage it has a considerable admixture of white, which blends with its mottled browns and greys so as to be very protective among the last snow-patches or the white bleached stones which the thawing snow leaves bare. In winter the bird turns completely white, except for its short black tail-feathers, and a small black eye-stripe in the cock. Its general appearance can be well seen in the so-called ptarmigan sold at the poulterers'; but the great majority of these birds are actually willow-grouse or 'rype' in winter plumage, and are imported from Scandinavia and northern Russia. They are larger than true ptarmigan, and the cocks have not the black eye-stripe. These willow-grouse are the nearest representative abroad to our own red grouse—the only bird peculiar to Britain, unless we choose to regard the St. Kilda variety of wren as a true species. It is another pretty illustration of the working of the British climate that the red grouse does not turn white in winter, though the willow-grouse does. The common ptarmigan is also found in Norway, but haunts higher ground, and is a good deal scarcer, just as it is outnumbered by the red grouse here.

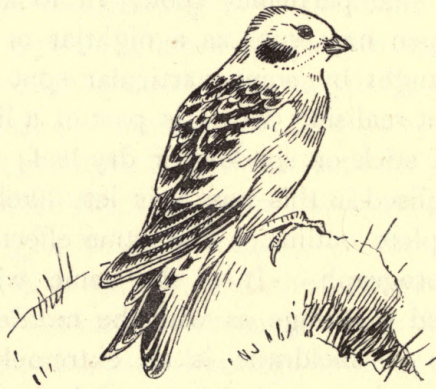
Last of our little group of the white Arctic birds and beasts comes the snow-bunting. It is rather an imperfect specimen of the group, for its winter plumage is not pure white; but in its haunts and habits it is a true bird of the snow-wastes. It breeds on the bleached, stony summits of the highest Scottish mountains with the ptarmigan, and also in the Shetlands. Its summer haunts extend far north to Greenland. It arrives in England at irregular intervals in considerable autumn and winter flocks, sometimes intermingled with other species, and generally seen near the

north and east coasts. At this season it varies a great deal in appearance ; some young birds have few or no white markings, while the amount of white in older specimens largely depends on their age and sex. The hens are less purely marked than the cocks ; but there is enough white on the wings, head, and breast of most of the birds in a flock to make them very conspicuous as they flit about the marshes or winter cornfields. There seems nothing definitely protective about their splashed plumage when they feed on ground clear of snow, as they often find it in their winter haunts. Even in a snow-covered landscape the large admixture of reddish and greyish-brown feathers on the back and wings prevents them from blending as completely with their surroundings as the ptarmigan or mountain hare. Nor is the protection apparently more complete in summer plumage. Then the brownish mantle turns to jet-black in the cock, and greyish-black in the hen, by the complete or partial wearing off of the brown tips to the feathers. A Norwegian naturalist describes the bold black-and-white plumage of the cock as forming a striking contrast to the snowfields and moorlands which it haunts ; and the pattern of the hen is almost equally distinct. Although there is an obvious similarity between the snow-buntings' white-splashed plumage and the snowy landscapes which they chiefly haunt, the likeness has stopped far short of the close imitation seen in the case of the ptarmigan or mountain hare.

The explanation of this degree of imitation seems partly to be found in the snow-bunting's nesting habits. It builds in cliffs and holes among stones ; and in these comparatively sheltered situations the hen bird does not need to imitate her surroundings so closely as the hen pheasant or wild duck on their open nests among dry brown leaves and herbage. A clue to the protective nature of many strongly contrasted

markings is supplied by the small black spots or patches in the white coats of all this group of Arctic birds and beasts. The ermine has its black tail-tuft, the mountain hare its black ear-tips, and the ptarmigan its black tail-feathers and eye-stripe. In every case there is some definite mark of contrast to the general design. Patches of this kind are sometimes explained as recognition marks, enabling one bird or animal of a brood to catch sight of its companion and follow it when hastily changing ground. But if it served to make its wearer more conspicuous, it would be more likely to endanger it than assist it. It seems more likely that the real effect of these contrasted markings is to conceal the whole outline of the bird or animal by concentrating the attention upon one particular spot. In looking at a bird sitting in an open nest, such as a nightjar or pheasant, the eye is often caught by some particular spot or bar in the plumage without realising that it is part of a living creature. It looks like a stick or shadow or dry leaf; and when the attention is localised in this way, it is less likely to recognise the bird's complete outline. The same effect can often be seen in a photograph. It is the same with large and boldly contrasted markings as with the mottled plumage of the pheasant. A sheldrake is an extremely conspicuous bird as one sees it on an aviary pond; but the eye can easily miss it a hundred and fifty yards away on the mud-banks or the water. The white parts in its plumage blend with the reflected light on the mud or water, and the darker patches are dispersed and suggest nothing like a bird. The black and white markings of the ptarmigan and its companions of the snowfields probably have a similar effect. In most cases the small black marks are situated at or near some extremity; when they catch an enemy's eye on the snow they would tend to prevent it from getting a general

impression of the whole form. The ermine's tuft or hare's ear-tip would appear like any dark stain or surface shadow on the snow; and the rest of the white form would blend indistinguishably with its surroundings. In the case of the snow-bunting the outline would be broken up in the same way, though the dark patch of the bird's back might be more noticeable. Though conspicuous when flying, its pied markings would hide it efficiently when at rest; and no protection pattern can do much to conceal a bird or animal when it runs or flies.





JANUARY

'When biting Boreas, fell and doure,
 Sharp shivers thro' the leafy bow'r ;
 When Phœbus gies a short-liv'd glow'r,
 Far south the lift,
 Dim-dark'ning thro' the flaky show'r
 Or whirling drift.'

BURNS, *A Winter Night.*

THE COUNTRY CALENDAR

JANUARY is the coldest of all the months, and the most wintry in weather, and is remarkable for 'a great barometric fluctuation.' But 'indications of spring' soon multiply. The birds pair. An occasional butterfly may appear; bats and hedgehogs stir abroad now and then. Marsham found the hawthorn in leaf on January 27th, and noticed rooks building on January 7th. The crossbills always and robins often begin to build. Some gardeners begin sowing seeds of annuals, and as the days 'draw out' the sense of spring may be felt at any interval in the frost. As many as twenty-five varieties of flower have been found in Hertfordshire during the month. It is a favourite saying :

'The blackest month of all the year
 Is the month of Janiveer.'

And it is a true prophecy in most years that the cold will grow stronger as the light grows longer.

Average temperature, 38·6°.
 Average rainfall, 1·89 inches.
 On January 1st, sun rises 8.8 a.m. and sets 3.59 p.m.



FROST AND SNOW

WHEN the sun goes down like a molten ball, its edge cut clean, as if it were bound by a metal rim, we know that a frost is falling. The mist has cut off all rays but the red rays, and thus the sun has taken the tawny hue. Else the sky is clear. Nothing between the surface of the earth and infinity stops radiation. The heat of the day rises upward and floats away undisturbed, bent neither this way nor that by any wind. Every condition favours cold, except that, though the sky is cloudless, much moisture hangs about the earth. We shall have frost, but it will be hoar-frost. By the morning every tree will be hung with a silver broidery, as fine and delicate a foliage as spring itself can offer. The land has been visited by a white frost. Another day you feel, even before you see, that the world is hard and bitter. The frost, heavy beyond its English wont, has left everywhere the very slightest sign of its arrival. Some signs it must impress. A grass stem is cut so fine in blade and runs to such a point, it lies so close to the radiating and evaporating earth that it chills the air to the dew-point, as official reports say, even when the sum of moisture is small; and the dew freezes. Otherwise a really black frost leaves few visible traces, except so far as hardness is apparent. The

roadway is a little bleached, the tops of the clods in the tilth are just lightened like hair over the temple. The difference between the white and the black frost is, of course, the amount of moisture in the air—that and nothing more; but all the very hard frosts are black. Though a damp cold is vastly more palpable, more penetrating to us, the thermometer feels differently. Moisture is always a source of warmth. It is a blanket to the earth. When clouds canopy the earth heat cannot radiate far. It is conserved and frost is discouraged. When mist and fog wrap the earth they always hold heat from the earth, acting in some degree like the clouds. So it comes about, though few country people notice it or will believe it, that the worst sufferers from frost are plants in the dry valleys. But the frosts of winter, as opposed to those of spring, excel both in splendour and in use. They are as beautiful as beneficent. No one has described the wonder of frost with either the accuracy or power of Francis Thompson, that unhappy genius, who, like his namesake, and in much the same manner, destroyed in London a power of observation meant for country life.

All frost and all snow are crystalline. There lies the wonder, whether you look at them with a microscope or the naked eye. It is a delight to watch the growing of frost. There is no better place for seeing the crystals form than in the corner seat of a railway carriage when frost is bearing. Your breath is written in letters on the window-pane almost as you breathe it. It is patterned out into a landscape of successive crystals, each quite perfect in shape and symmetry. But the sight is stranger on a sheet of water. Frost seizes the water in delicate rays, and afterwards fits the filigree together, and pieces out the pattern. As the cold falls below the freezing-point you see a sort of shiver move along an undefined line across the water, as a nerve vibrates under the skin; and

then the line, the thin course of the movement, becomes a rigid mark. A few minutes later you may pick up from the water a delicate stick of crystal, that fades at once in your hand. The tip falling, perhaps, on to a fellow-crystal in the water beneath, tinkles out a thin and bell-like note, which is one of the most distinct and memorable sounds of any season. It is scientifically, perhaps, an unexpected fact, and a very happy one, that water as it approaches the freezing point swells. We are accustomed to cold associated with condensation, but if it did not happen that water swelled as it froze the world would be uninhabitable in many countries. The ice would sink to the bottom, build itself up from the bottom to the top, and remain permanently where now it is quickly thawed. Those who lament their cracked pipes have at least this consolation, that if frozen pipes were not forced outwards by frost the whole world would suffer.

All that frost manufactures is ice. Hail and snow and hoar frost and 'cat ice' and icicles are as truly ice as the smoothest and hardest and blackest that covers a pond. The difference is that in snow and hoar frost or wherever the water colour becomes opaque and bleaches, air is interposed. It acts as oxygen on a fire to bring out the colour of cold as the other of heat. It is the peculiar virtue of snow that every particle holds air as firmly as does cotton-wool. The corn or grasses that it covers, the animals that it may entomb are not easily affected. The covering lies light, and between and about every crystal pure air clings so that breathing is possible in the medium. Squeeze air out of snow, as its own weight may do, and ice appears. If the snow is very deep and has lain long, the under part is clear, good solid ice. This is the proper relic of an unchanged quality. The attraction of snow is such that we all are inclined to regard it as the characteristic mark of a season. It is of course

comparatively rare in England. Not once in a generation is it deep save where it is drifted, and a man may keep a sledge for five years without the chance of using it for a day. In such warm spots as the Isle of Wight, it is a notable marvel if snow lies at all.

But no weather phenomenon so impresses the mind as frost and snow. Their influence is such that people in the South have as constant a belief that December is a cold and snowy month as those who live in sight of the northern hills which may be capped with snow from October onwards. How vivid the sight is when falls

‘The new soft fallen mask
Of snow upon the mountains and the moors,’

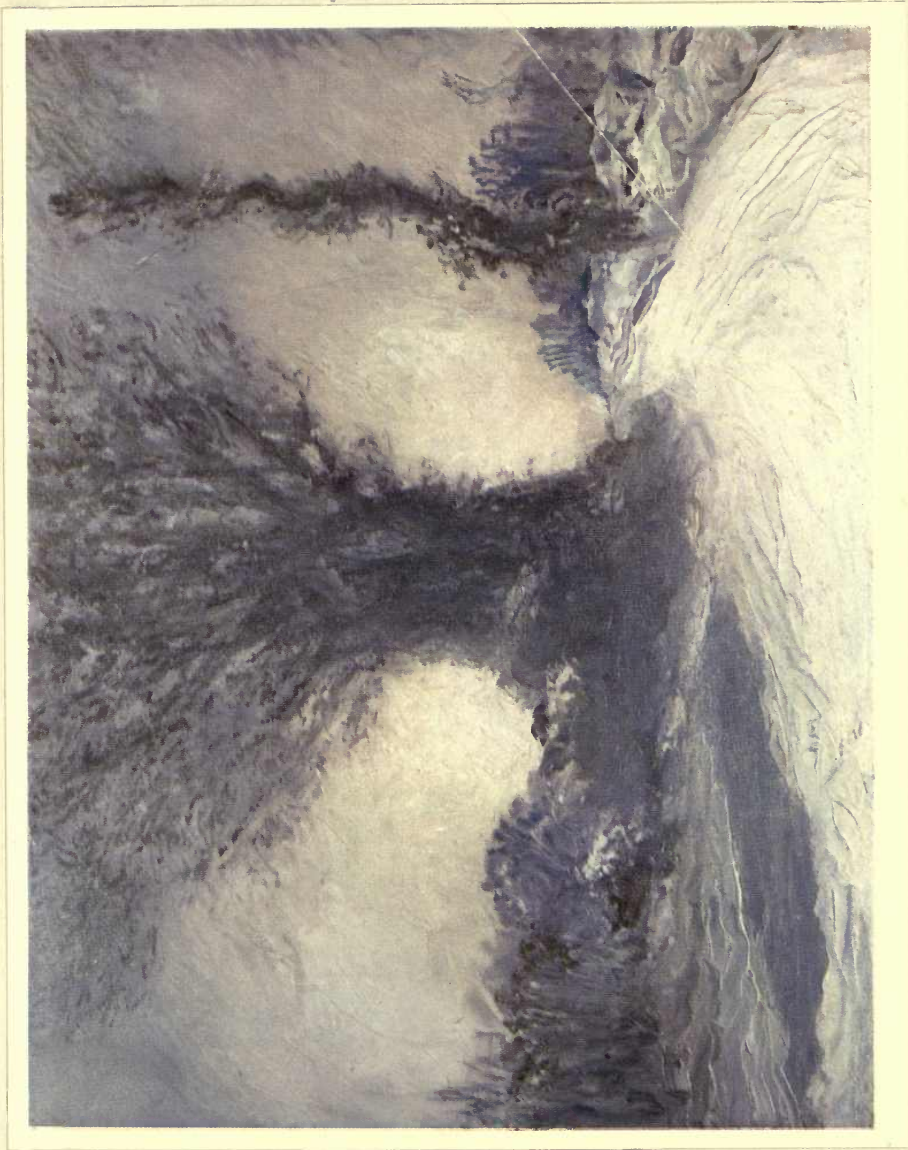
and how vividly snow pictures are left in literature. Jan Ridd finding the sheep in the snowdrift is the best picture in words ever painted by Blackmore, the novelist of south-west England, where snow is rarest.

Did the Laureate in his warm and quiet Berkshire home ever write a better description than in his poem of London snow, though it was written chiefly as a metrical experiment?

‘When men were all asleep the snow came flying,
In large white flakes falling on the city brown,
Stealthily and perpetually settling and loosely lying,
Hushing the latest traffic of the drowsy town;
Deadening, muffling, stifling its murmurs failing;
Lazily and incessantly floating down and down;
Silently sifting and veiling road, roof, and railing;
Hiding difference, making unevenness even,
Into angles and crevices softly drifting and sailing.
It lay in the depth of its uncompacted lightness,
Its clouds blew off from a high and frosty heaven;
And all woke earlier for the unaccustomed brightness
Of the winter dawning, the strange unheavenly glare;
The eye marvelled—marvelled at the dazzling whiteness,
The ear hearkened to the stillness of the solemn air.’

SNOW

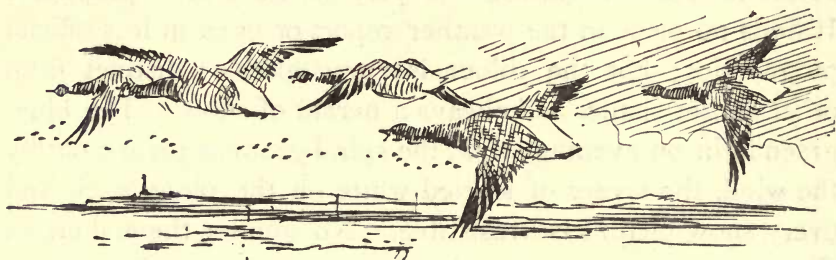
By HALDANE MACFALL



Snow, one may say, never does harm. It is the kindest and softest of all the frost visitations, though its thawing is the most unpleasant of all weather incidents. The big flakes come down like winnowed plumes or butterflies falling from the tree-tops. Each flake is made of crystals identical in form, so perfect is the process; and when the storm is over the matrix is broken; and when next snow falls another pattern, each crystal again identical with its neighbours, is sent. Every accompaniment of snow is beautiful. A sunset before snow takes on a smoky orange tint, which—or so it seems to some—is among the very surest aids to prophecy. It finds no place in the weather report or even in less official prognostics; but the colour is unmistakable; distinct from other sunset shades and always a herald of snow. The blue-green light on evening snow, the spiral grooves planed out by the wind, the layers of storied white on the pines, each and every snow picture is irresistible. No wonder the makers of Christmas cards cannot resist the temptation to persuade us that England too is a Lady of the Snows.

East and west England, which differ not less than north and south, each receive a quantum of snow; but they are sharply contrasted in their experience of frost. The frost area of England is the fen country. It is a rarity if the Cambridgeshire fenman does not put on his skates and take a day along the dykes and meres. The flat and fertile land is singularly cloudless, and lies open to the east wind. What more is wanted to encourage frost. The meres are shallow waters, and the dykes are unsheltered by trees, except perhaps that here and there you may find a tree standing on aerial roots from which the drained land has fallen. A few days of even moderate frost create a network of real highways, by which you may skate if you will many scores of miles. You may, for example—it was the last long skate

that the writer made—step off the platform at Holme Station, on the Great Northern Railway, just south of Peterborough, straight on to a dyke and make a forty-mile trip along the various dykes. They are mathematically called in the vernacular, from their breadth, the sixteen-foot and the thirty-foot, and the rest. Such a journey through Chatteris and March, and along the old Nene, gives a new picture of England. The birds are different; you may put up a number of Brent geese and many mallards. The general scene is pure plain broken by windmills, and the chief sound



BRENT GEESE

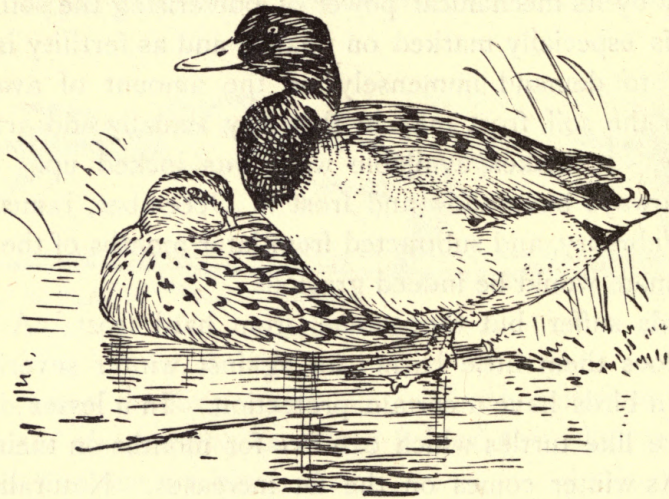
is the ring of the fenmen's skates. They travel often in companies of six or eight, one close behind the other, swinging in time like one machine.

A bearing frost, a condition in which most people except hunting-folk delight, is not so harmless as snow. If it come late and the season is warm, it may destroy wheat which is winter-proud, perhaps kill winter beans and play havoc among the tenderer roses of our garden. But its visitation is beneficial on the whole. The moisture freezing and swelling in the earth crumbles it into a fine seed-bed. The cold keeps back growth and prevents that cardinal danger of the English climate, an early spring. Weeds have always sprung up in quantity since the autumn, and some of them such as dandelions may begin to seed as early as February.

But the frost destroys the whole brood and restores their virtue to the soil. English farmers have an almost mystic belief in the frost and snow. They think that both, but snow especially, give to the ground some definite fertility from their own store. They will use the blessed word 'electric' in discussing the question. It is true that a snowstorm is always associated with some increase of electrical phenomena; but how this adds fertility to the soil passes present powers of conjecture. Frost doubtless increases fertility by its mechanical power of pulverising the soil. Its effect is especially marked on chalk; and as fertility is now known to demand immensely on the amount of available lime in the soil, frost may in this way actually add artificial manure. It makes available what was locked up. If we could always have snow and frost in December, January, or even February, and subtracted from later months of the year, our climate would be indeed gracious.

Birds suffer, but they alone, from hard frost. A week of it does them little harm; for against winter severity all our own birds have a certain protection. In a lesser degree they are like turtles which can live for months on their own fat. As winter comes on the fat increases. Naturally and by inclination they prefer to eat less in winter times, and it is only when the frost is very long that hunger begins. Like the trees, the later the frost the more the suffering. Their appetite grows with the duration of light. A thrush is twice as hungry in February as in December; and when the ground is too hard for a bill to penetrate, when the worms are driven back from the surface and cockchafer grubs unprocurable and berries grown scarcer—then the thrush may die if the frost holds, though it may not be severe. They suffer also from thirst. It is a very strange thing that if you put out and keep open a bowl of water,

birds will come greedily to it during frost. There may be hoar frost thick on the ground, or even snow, but instinct seems never to have taught them that either can quench thirst. The fact bears witness to the comparative rarity of the need.





LIFE IN WINTER NIGHTS

EVEN in midwinter the fields and woods are full of activity by night, and the darkness and long spells of silence hide the restlessness of many different forms of life. Man is a diurnal animal; his eyes have little natural power of seeing in the dark. If he had been framed in a savage state for the nocturnal life which is natural to many other species, his eyes would have been large and liquid like those of the lemurs, or would have had the unattractive faculty of contracting the pupil vertically like those of the cat or the fox. Long civilisation has diminished even his original modest power of nocturnal vision; and so, though the more artificial his life becomes, the more he carries on his activities by night, he works and plays under a wealth of artificial light which is strange and baffling to the wild life of the darkened woods.

Yet the use of light is natural to all the higher natural organisms; and most of the creatures which stir abroad at night and sleep by day have inverted their normal habits for some plain reason of self-interest. The innumerable multitudes of rats, mice, voles, and shrews which swarm unseen in the darkness have become nocturnal as a defence against predatory diurnal creatures, including man. To this certain species of birds and beasts of prey have responded by becoming nocturnal also; and so the old fight is fought out on changed ground, in which the balance of advantage remains with the weaker creatures which need concealment.

Profound as seems the stillness of a calm winter's night when we pause to listen in the garden or among the woods, it is seldom long before we hear some significant sound. Sometimes it is the cry of the hunter ; more often the subtle rustling caused by the passage of its timid prey. The brown owl halloos in the woods, or the white one screeches over the cornfield ; at midwinter and early in the year, the bark of the dog-fox comes down from the warm side of the brake. Foxes bark when seeking mates, or when living in comparatively close attachment to them in the early months of the year before the cubs are born. They hunt in skulking silence ; but the bark of the fox is a sound full of meaning to the keeper and to all others whose thoughts run on the wild life of the countryside. The farmer thinks of his poultry, and reminds himself to look to-morrow at the loose plank in the side of the henhouse ; and the lover of wild life recalls the litter of lithe and chubby cubs which he used to watch playing by the mouth of their earth last Easter-time, and thinks of the other secret woodland existences on which the dog-fox is stealing in enmity to-night. Beneath the peace and darkness of the night the eternal strife of Nature seems always more intense by contrast with the overlying calm. Death never comes more savagely than to the sparrow caught from its sleep by the wood-owl's claws ; and even in the quiet border the gardener knows what a scene of pillage may meet him in the morning, if the wood-mice have already discovered his sprouting crocus-bulbs.

Wood-mice have been said, and probably with truth, to be the most numerous species of animal in Britain ; the only likely rival to this pre-eminence would be the common rat. But wood-mice abound in outlying woods and copses to which rats seldom penetrate ; and they are also common in many town gardens, though they do not compete with the rat in

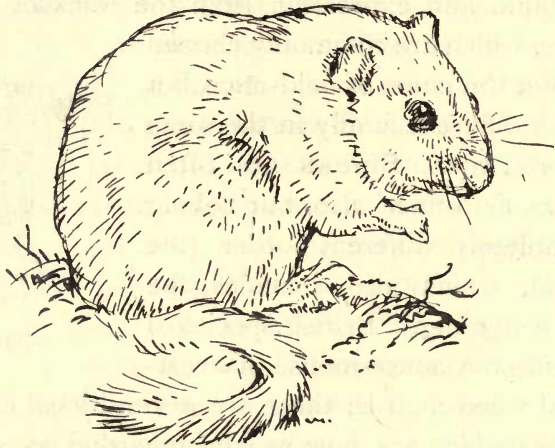
warehouses or sewers. The so-called 'Old English' black rat—which was merely an earlier immigrant—is a much more attractive animal than the common brown one; but the wood-mouse is far more graceful and pleasing than the black rat, as well as being so far free from any suspicion of conveying plague. It is a rather larger and much shapelier creature than the common house-mouse, with larger eyes and ears; and the reddish-brown fur of its upper parts is almost as handsome as that of the dormouse. It has quite a different build and expression from the thickset and blunt-faced voles, which are commonly classed with it under the name of field-mice, but belong to a different family in the same order of rodents. Shrews are often regarded as field-mice also, but belong to a completely different order (the insectivora), which also includes the mole and hedgehog. British species of mice include the house-mouse, harvest-



WOOD-MOUSE

mouse and wood-mouse; there are several local races of the wood-mouse which are now usually regarded as sub-species. The dormouse belongs to a separate family, with some points of similarity to the squirrel; and besides these four species, there are the bank and field voles (of the same family as the water-vole or water-rat), with some local sub-species like those of the wood-mouse. Shrews include three species—the common shrew, the water shrew, and the lesser shrew, which is the smallest British mammal except the harvest-mouse. All this group of rodents and insect-eaters are largely nocturnal; but they are not all active in winter. The sleep of the hedgehog is unbroken until the spring; and the dormouse only wakes for a few brief intervals, and appears to make little use of the stores of nuts and seeds

which it collects in a desultory manner near its winter nest. The hibernation of the hedgehog is as thorough as that of many animals in severer winter climates; but it diminishes in the case of many of the other insect-eaters and rodents to a few prolonged sleeps during the sharpest spells of frost. On mild winter nights the wood-mice are as active as in October, when they collect and eat their heaps of berries in old birds' nests, as was described in a former chapter. They are among the most nocturnal species of their family and its

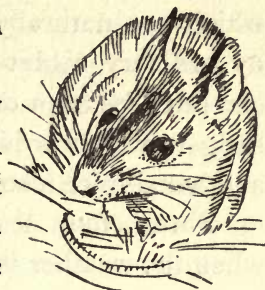


DORMOUSE

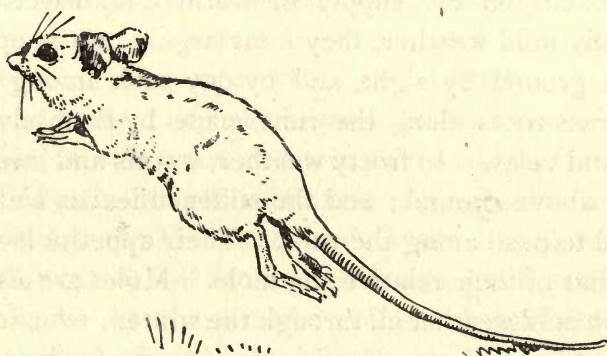
associates, as is indicated by the large size of their eyes and ears—the eyes being large so as to make the most of the scanty light, and the ears to supplement it by the sense of hearing. Besides the fruits and berries which they heap together in autumn, they will eat farm and garden seeds, roots, leaves, bulbs, the stems of flowers, and the bark of twigs and saplings. They also feed occasionally on insects. Though the most numerous of species of their group, they seem also to be one of the quietest. Now and then they are found by day, running along a bough in a thick hedge, or sitting up with their sensitive ears feeling the air; but from

the glimpses that often accompany the short dashes and high-pitched squeaks of mouselike animals among the herbage, these wayside disturbances are caused by voles and shrews. Probably it is the same at night, when the same sounds can often be heard in long grass and on overgrown banks.

Harvest-mice are a comparatively scarce species; and their small size and comparative drowsiness in winter would in any case make them inconspicuous in the life of the night. Bank-voles are very numerous and active, and often do a great deal of damage in gardens, though less than the wood-mouse. They are a less strictly nocturnal species, and can often be spied running about the hedgebanks and across rough ground by day. This species is the 'long-tailed vole' as opposed to the 'short-tailed vole' or field-vole; but their tail is very much shorter than that of a mouse. Their colour is warm



WOOD-MOUSE



WOOD-MOUSE JUMPING

reddish-brown in summer, and a duller brown in winter. Their heads are very different from those of mice; the ears and eyes are small, the muzzle blunt, and the hair of

the broad cheeks rough and broken. They are pretty little creatures, but without the gracefulness of the true mice. Besides raiding garden beds, bank-voles are particularly fond of bark, and sometimes do much damage to young saplings, which are naturally not protected from these small creatures by ordinary rabbit-netting. The marks of their fine teeth can often be seen on peeled stems or twigs in plantations or hedgerows towards the end of a hard winter. Field-voles and wood-mice also eat bark, but less often.

Shrews hunt actively in winter, both by day and by night, when the weather is not frosty enough to make them drowsy,



MOLE

and to cut off the supply of worm and insect food. In normally mild weather, they hunt largely on the open surface of the ground by night, and by day push among the leaves and grass-roots along the runs made by themselves and by mice and voles. In frosty weather, worms and insects are not found above ground; and the stiffened leaves and soil make it hard to push along the runs. Their appetite is very large, as is that of their relative the mole. Moles are also busily at work in mild weather all through the winter; even in moderate spells of frost we can see each morning the fresh earth thrown out by them on the banks of sheltered lanes and the warm flanks of copses facing the south. The rat has no periods of hibernation; in the hardest frost it merely moves to more sheltered quarters in buildings or rickyards, or the warmth

and plenty of a corn-stack. Rats, like sparrows, cling to the neighbourhood of man, but not so closely. Sparrows seldom or never breed or roost many hundred yards away from a human dwelling, or some such spot as a rickyard or rubbish-tip, where they can thrive on the products or refuse of man's labour. But rats at the beginning of summer migrate in considerable numbers from houses into the arable fields and copses, burrowing and breeding in the dry banks; and they do not all go back in winter. If we watch the tunnelled bank of a lane or the edge of a dry pheasant-covert on a moonlit night in December or January, the number of the rats passing to and fro along their well-worn runs gives us some slight idea of the enormous army of these creatures in the whole country. For such spots are merely their outlying settlements; the mixed living that they pick up on and about the corn and root fields, and the pheasant food scattered in the copses, represent only a few minor items in the vast bill of fare from which they pick their diet. There is unusual point in the scientific Latin name of this species—*decumanus*, the tithe-collector; but the brown rat often takes much more than a tithe of the vegetable and animal produce of a spot where it abounds. It has a versatility and ingenuity which would be admirable if they were not so mischievous; and it seems able to adapt its tastes and habits to all conditions which promise it an adequate living. In the copses and cornfields and rickyards it seems to love dry soil for its burrows as much as a rabbit; yet it luxuriates in drains and sewers, and regularly haunts wet streamsides, and the oozy banks of tidal creeks and lagoons. This adaptiveness to varying conditions is one of the characteristics which have enabled it in the last two centuries to usurp the position formerly held by the black rat, and to spread to the remotest islands. The black rat

clings more closely to dwellings, and has not the capacity of the brown rat for getting a living in country as well as town. It is by no means almost extinct, as is sometimes thought. It is fairly common in a good many seaports, where its numbers are no doubt reinforced from time to time by



BLACK RAT

recruits brought by vessels from the Levant and the Far East, which are its headquarters. It also still holds its own in a few remote spots where the brown rat does not seem yet to have succeeded in ousting it. It scarcely deserves the sympathy sometimes lavished on it as a respectable old British animal crowded out of existence by immigrant aliens ; for it is undoubtedly an alien itself, which made its way to Britain a few centuries before its successor and oppressor. Even its more modest greed and temperate rapacity are to a

great extent outbalanced by its sinister responsibility as the principal agent in the dissemination of bubonic plague. It is the chief host of the plague-bearing flea, because it is peculiarly the rat of human habitations in India and China, where plague is most prevalent. But the original source of plague is believed to be a central Asiatic marmot; and the flea which conveys the infection is known to be harboured by the brown rat also. In the recent cases of plague in Suffolk the evidence strongly pointed to infection having been conveyed by rabbits. If a serious epidemic of plague were to break out in Britain in our own time, it would be much more likely to be disseminated by the brown rat or rabbit, or some of the common voles or mice, than by the scarce black rat. Possibly the future may bring us some new immigrant rodent which will oust the brown rat as effectually as the brown rat has dispossessed the black one. Such a 'super-rat' would be an absolutely appalling pest to industry and agriculture, and we can only hope that in the development of the brown rat and the occasional local plagues of field and bank voles, the evolution of the rodents has reached its crowning triumphs.

Even rats have not entire immunity at Nature's hands; and they pay their own tithes to owls, and foxes, and otters on every winter's night. The chief food of otters is eels; and it is on them rather than on any kind of fish that they feed at all times of year, and especially in winter. In summer they eat large quantities of frogs; but this form of diet is cut off in winter, until March wakes the frogs from their lairs in the mud, and sends them swarming to the riverside ditches. Young or weakly rats and water-voles form a considerable minor element in the otter's diet. Barn or white owls kill an enormous number of young and half-grown rats, as well as of mice, voles, and shrews; and the scarcer long-eared owl is

also a great ratter and mouser, especially in spring when it has young. Brown or wood owls prey chiefly in winter on small birds caught up from the roost, though they too kill a small number of rats and mice. Foxes destroy rats and field-voles in large numbers; some seem to hunt them in preference to rabbits, which in most cases form the largest part of their varied diet. Foxes will eat almost anything of an animal nature, whether dead or living; just as otters living by the sea will eat shellfish and even lobsters, foxes within reach of tidal marshes feed on crabs and the dead bodies of birds washed up by the tide. Pheasants in their roosts on the branches to which they flitted crowing at dusk, are normally out of their reach; but now and then the cry of a cock bird rings loudly from the hollow woods, and tells how a fox has sprung at a pheasant roosting on some lower bough.

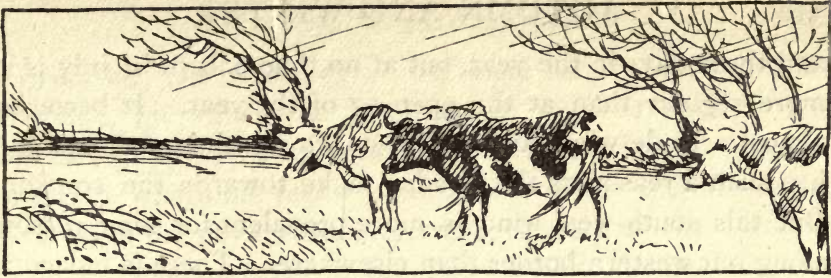
Rabbits and hares are both active on winter nights; in order to estimate how busily they run to and fro under concealment of darkness, it is necessary to spend a morning in following their traces after a fall of snow the previous afternoon. They scrape away a thin layer of snow to feed on the roots and blades of the herbage; and when the snow is too thick on the level ground to make this convenient, rabbits dig by the sides of bushes and among rough herbage where the snow lies hollow and bridged. By sunrise, when the birds are feeding again after the long and hungry night, only the footprints of the hares and rabbits remain. Except at the mating-time in late February, March, and April, hares are strictly nocturnal animals, lying up by day in their forms; when we see them by day at other times of year, they have been disturbed from their hiding-places. Rabbits are also a mainly nocturnal species, though being much more plentiful and confident, they move about more freely by day when they have shelter close at hand. A night when the

ground is covered with hard-frozen snow is their chief time for attacking the bark of young trees.

In autumn the cries and calls of migrating birds often stream downward by night from the upper air, especially in foggy weather, when the birds become confused and restless. In midwinter these cries are heard seldom; and the great passages of birds which often follow a sharp spell of frost about Christmas take place by daylight. But certain kinds of water-fowl and game-birds feed by night; we hear their notes on lakes and from the wide harbour flats, and see the holes dibbled by their bills in the mire. Mallard, teal, and wigeon are habitual night-feeders; the intense whistle of the wigeon travels a great way over the water in the hush of the darkness, and draws attention to the lower quacking of the mallard. Geese seem by nature to be day-feeders; and the ducks also have the small eye which distinguishes day-birds from those which feed by twilight or night. But geese as well as ducks have become partly nocturnal for protection, where their feeding-grounds are too exposed by day. Grey geese flight over to the inland fields before sunrise, so as to take up a safe position under cover of the dawn; and mallard pass to their favourite feeding-grounds at dusk. Snipe and woodcock are more purely nocturnal, and have the large nocturnal eye. Both feed chiefly after dusk, and the woodcock almost exclusively so. Snipe in hard weather can sometimes be seen feeding by day; but both they and the woodcock are birds which learnt self-protection by concealment in order to escape such foes as foxes and the larger hawks, and are confirmed in the same habits by the persecution of man.

Winged insect life is rare in the winter nights; and the bats which prey on it in summer are all hibernating in houses, and caves, and hollow trees. The pipistrelle—our

commonest small bat—may often be seen hawking for insects on mild winter days, especially towards sunset; but it does not stay out long after dark. The supply of insects is then too scanty for it; and yet there are moths abroad on mild nights all through the winter. It is remarkable that some of the frailest and feeblest of all our British moths are hatched in the nights of November, January, and February. They belong to the light-winged and thin-bodied group of geometers, and include the winter moth, a well-known orchard pest. The male winter moth is winged, though a feeble flyer; but the wings of the female are so stunted as to be useless for flight, and the moth on emerging from the pupa in the earth, creeps up the stem of the fruit-tree on which she was bred, lays her eggs there, and dies. This inability of the female to wander is doubtless the safeguard of the species, and enables it to survive the storms and rain of the unkindly season when the moths emerge. From peril of frost they are protected automatically, since cold retards their emergence, and keeps them sealed in the pupa until a mild spell of weather arrives. Besides the winter moth, specially so called, this group of moths which appear in winter and have wingless females includes several other species, which appear between October and March. They seem the most helpless of nature's sacrifices to winter's rage, as we see the male's filmy wings outspread on the small roadside puddle where it was dashed and drowned, or sticking to the side of a newly tarred telegraph post. Yet none of the stronger forms of life abroad in the winter nights give so vivid a promise of spring as these little grey moths. They bring visibly before our eyes the tender life hidden deep in the bosom of nature through the winter, and show that the time is coming when a multitude of brightly coloured wings will shimmer in the soft spring nights.



THE NEW YEAR WIND

OUR fields and woods' undergrowths and the wild life in them, even the greater features of our British landscape itself, are vitally influenced by the west and south-west wind which blows during one hundred and fifty-two days of each year. Indeed the whole of our climate is due to this prevalence. We talk of the Gulf Stream as warming England out of the winter which should be the due of her northern latitude. But there is also a Gulf Stream on the other side of the Atlantic which has no such beneficent effect. The truth is that in the warming system of equable England the Gulf Stream is the fire and the west wind serves for the pipes that carry the warmth to all the pleasant rooms. It would be of small service that the Gulf Stream should warm the air that lies upon it if a contrary wind carried the warmth out to sea.

In this respect the south-west wind does service to all England alike; but in its more obvious appearances it is a very different wind on the two sides of England. It makes the one broad regional contrast that we can discover in this various island. This wind has a particular preference for January. At this season over a great region to the south of Iceland the air suffers depression, and towards this expanding area other air makes in the spiral manner that is peculiar to it.

The wind blows south-west on the average for one hundred

and three days in the year, but at no time except in July is it more regular than at the opening of the year. It becomes almost a trade wind, and makes its way to the north-east for just such a reason as the Trades make towards the equator. But this south-west wind is more prevalent for some reason along our western border than elsewhere. There is indeed a little pocket represented by the Eastern Counties where the winds behave rather differently, have a different period of prevalence. Once again the east and west—'and never the twain do meet'—are sharply divided. A low glass or period of low pressure always portends the south-west wind. With the first symptoms of a shift to north or east the glass rises with extreme rapidity, whether it is going to be fine or not. It is neglect to notice these qualities in the two winds that prevents many people from reading the barometer, out of which the most amateur prophet may extract daily interest. After a warm and charming day of early spring, which has brought us out into the garden to marvel at premature events: the humming of bees, the long catkins on the hazel, the flowering periwinkle, the buds on the gooseberry, the spring song of the tit, perhaps the appearance of a queen wasp or hibernated butterfly—after such a day as this, when the glass ought, it is often held, to acknowledge the fairness, you will see the mercury which was low mount and mount. The next day you believe will surely be something more perfect still—*l'extravagance du parfait*. The hope is rarely fulfilled. It is not unlikely that you wake to the rattle of a hailstorm, and are aware of the chill of very winter in the air.

One cannot exaggerate the infinite variety of England, its unexpectedness, the quick contrasts. There are no two counties which can be called similar. Huntingdon, one of the very smallest and in general regard almost the least

remarkable, has stretches of the most fertile black soil in England, on which you can see the rows of spring corn run as regular as the ruled lines on foolscap. It has stretches of marsh, where the reeds rustle in the winds and the snipe bleat as in the days when Hereward, the last of the Saxons, kept his remnant safe on the Isle of Ely. It has a great wood, where only certain rare butterflies are to be found. It has deep clay wolds which are the paradise of the fox-hunter.

In 'this England' where all things differ, where even parts of a county, as in South Devon, have their peculiar breeds of stocks, nevertheless one great and distinct division may be made. 'East is east and west is west.' The whole of the west coast differs profoundly in every respect from the whole of the east. It differs in its plants and in its animal life hardly less than in its visible features. For the cause we look to the wind. It may almost be said that England has only two divisions, east and west, and only two winds, east and west. South winds are but a part of the west wind, and north winds of the east. We all know the west wind as it affects our feelings and as it builds our sky scenery. At its coming the barometer falls. The more wildly it blows the lower falls the glass. But at its worst, even when it comes with snow in its embrace, it confesses to a certain softness and a certain waywardness. It usually brightens the sky as soon as ever the clouds have emptied themselves.

'Day of the cloud in fleets: O day
Of wedded white and blue,'

could only have been addressed to a day when the wind was westerly. Its most characteristic painting is a flock of clouds like great sheep of the plains. They are white and woolly. They turn a silver lining to the light, and there is

plenty of room for dark hues too, to be caught in the hollows. It brings the sunsets which are the glory of the countries that suffer from a dry soil; sunsets in which the clouds are twisted into rough fantastic forms, that blaze and smoulder and blacken all at once in the west, like whin in a heath fire. Slips of sky between them lie like strips of downland grass. The riot of colour sends a mild vibration across to the east, where clouds, flying from a wind that at the sunset hour begins to fail in the pursuit, are suffused with an even and gentle colour. With colour and brightness the wind



THE PEAKS OF CADER IDRIS

itself seems to be endowed, just as the east wind with the monotony of colourless clouds on unbroken skies.

If we probe for reasons, the reason lies in the dews that come from the west. The jagged highlands of the Lake Country, the peaks of Cader Idris and Snowdon, comb out of the west wind the mass of its moisture. The rain is deposited from the moment the wind meets the first land, or even the viewless islands to which the Irish people of Clare and Galway gaze in some strange and mystic faith. When it passes these lands and moves across eastern England it holds nothing more heavy than showers. Over the flat plain of the Eastern Counties it passes almost dryshod.

Some of the effects of this favouritism of the west wind are obvious enough. Any one may see them from the window of an express train. That green is the national colour of Ireland is thus due to the west wind. Under the gift of perpetual rain the lush meadows are so rich, where the land permits, that they will fatten a bullock to the acre, a thing unheard of east of Rugby. In the wet districts grass and stock take the place of crops. The people are born with the gift for tending and indeed for selling animals; and the small farmer can use the labour



'THE STONES OF THE BANKS ARE ENCRUSTED'

of his wife and the smallest of his children in looking after them. Like Ireland are the beautiful little grass valleys that curl with the rippling streams about the western fringe of South Wales. As you leave your express train for a closer view you find the print of the rain-bearing wind on everything. The stones of the banks are encrusted with moss, just as in the Lakes every broken twig of birch carries a burden of mushroom or fungus growth. The grass begins to sprout when spring is very young, even in January, and in the late summer the folk are cutting an aftermath. The cornfields are never free from rank weeds; and heavy lichens and mosses cling to the healthy trees. Only to the trees is the wind unkind. They often crowd together for

protection; those to the west no bigger than bushes; and behind them the sheltered ranks gradually and regularly slope upwards as if preparing to receive cavalry.

All wind is an enemy to the growth of trees and bushes. It is indeed the worst of all enemies, as few realise except the real gardeners. The winds are more cruel than frosts to young growth. They tear the cells, rock the trunk so that the roots oscillate and the rootlets lose that close and intimate touch with the soil on which vigour of growth depends. The wind-screen is the first necessity of every garden if fruit is to be grown, as even Government departments understand where their officials deal with areas on the west coast. Often in vain has the endeavour been made to grow forest trees about the hills on the west coast of Ireland. The west wind will not now permit it, although in the bogs of this district lies abundant proof that years ago the trees conquered the wind. When he sees recovered from the black ooze great trunks of oak, parts of a vanished forest of flourishing wood, the heart of every afforester burns to restore the extinct scenery. So his effort is now to establish screens of spruce, as the nurseryman grows hedges of beech and hornbeam and alder, that behind the acclivity of these ranks planed by the west wind the forest may re-arise over the barren slopes. That patriarchal board, under whose governance is placed all that part of Ireland which is subject to the first brunt of the west wind, provides the little farmers with 'screen' trees as well as fruit-trees. But those who most feel the west wind understand it least, and great is the ridicule this very necessary defence arouses in the minds of those who have regarded their coast as barren and open to the west by the ordinance of insuperable powers.

Winds of the western seas are as kindly to grass as

they are severe upon trees. Wherever the west wind blows off the sea and shakes its moisture down month after month, there grass flourishes if there is any kindness at all in the soil. So it is due to the west wind that the milk supply of London is controlled by the Welsh, and that the social regeneration of Ireland has been promoted more by the multitude of creameries that have sprung up than by any other influence less closely allied with the native clime. The student of weather could indeed infer *a priori* from the incidence of the wind a quantity of the social conditions, almost as certainly as the geologist from a knowledge of the strata and seams. The whole of eastern England lies behind such a wind-screen as the nurserymen or afforesters design; for the westward is high and rugged, the east a plain or gentle valley inclining into the shallow sea and re-emerging in Holland. But the screen is most notably effective in robbing the eastern clouds of rain; and on the whole giving England as good a proportion of rain as any country could desire.

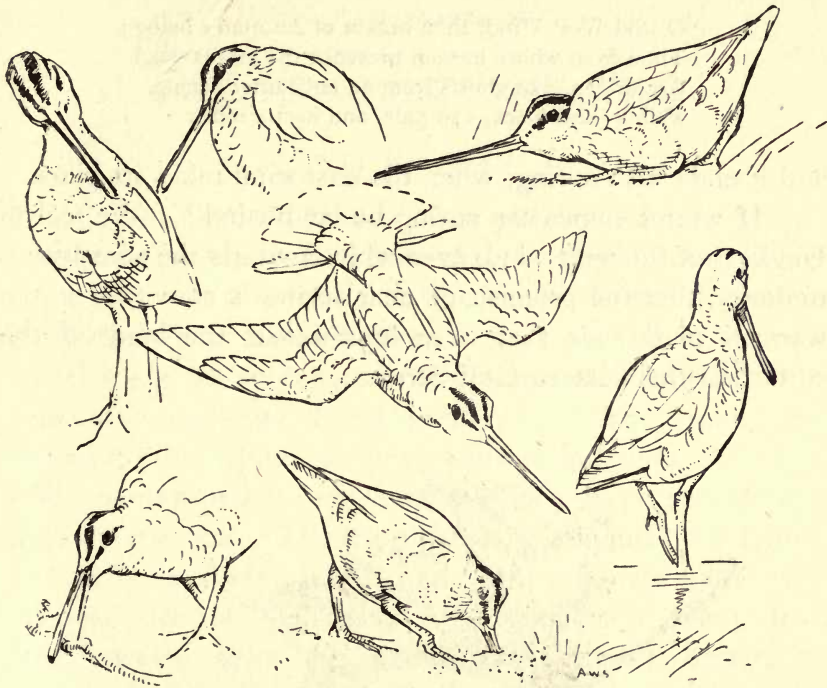
From December the months begin to grow drier, and the west wind gives place to the rival winds, that mark the depths of winter cold as well as the steady sunshine of spring. In a discussion on the effect of wet, a most ingenious case was made out by Mr. Cornish, who had a very wide knowledge of natural history, in favour of the drier regions against the wetter. He argued that wet is bad for all animals, indeed that it is the worst of all their enemies. It lames the sheep, it kills even young ducks, it drowns partridges, it depreciates vitality in every young thing. There are exceptions that he did not name. Some vermin flourish best when rain is heaviest; but in general, if we were to make a census of the wild animals of England, we should find that the dry eastern half of England vastly

surpassed the population of the west of Ireland. On a map duly coloured to represent density of animal population, Norfolk would take on a very deep hue and Westmorland or Merioneth or Leitrim would pale. This is the more curious as moisture is favourable to insects, and birds multiply round standing water and by the side of streams. The wet makes some of the western islands almost poisonous to domestic animals in winter. The traveller from Skye in October will find it quite difficult to escape from the island in any comfort by reason of the herds of sheep with which every passenger steamer is at this season crowded. The sheep pine and die if left on the island during the winter months; and this is due less to the food than to the climate and the untempered winds blowing salt off the Atlantic.

It is not well to push a theory to its utmost. The west is of course the special home of some of the birds, who find kindly open lands not offered by the east. The great westerners are snipe and woodcock. In September you may find wisps of snipe almost within the London suburbs. Along the water meadows of the Wey, within twenty miles of London, the writer has seen more snipe than at any winter expeditions in the extremest west. You may flush there wisps of sixty to eighty birds. They get up like finches in the stackyard. At any other little marshes, old brick pits, or rush-beds, scattered about the counties, you may at this season find some odd snipe, a few of which have nested in the country. But later, when winter comes, the birds are gone. In January or February you may walk about eastern fenlands, where the snipe abounded in November, and never find a bird. They are all away west, as far west as they can fetch. One winter day, on a South Welsh moor, you put up snipe every twenty yards or so; and local sportsmen have shot fifty couple. The next nine-tenths are gone across the

channel to be found later perhaps on the snipe hags of Clare. To them the west wind has no terrors ; and they discover an ideal home in the Outer Hebrides, from which other animals shrink.

It is a common mock against the Englishman that whatever subjects may be broached he will in the sequel return



ATTITUDES OF SNIPE

to the weather. Perhaps after all it is among the most important of all conversational subjects. But talk about the west wind has risen to the very highest summit of which expression and feeling are capable. Shelley's 'Ode to the West Wind' is supreme among odes ; and if we must compare it with other odes on my subject, Keats's 'Ode to Autumn,' another conversation on the weather, will come next it. In his childlike and ingenuous way Shelley con-

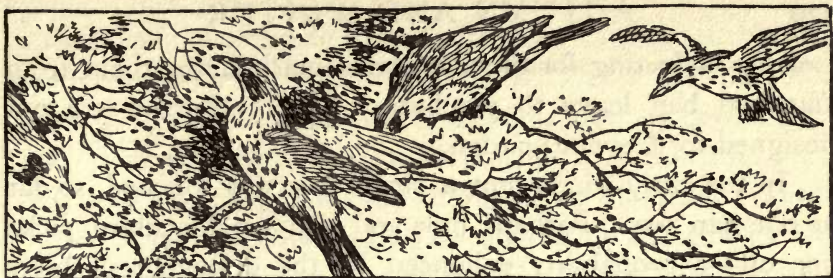
fessed, to his pride, that one stanza of this ode was an almost perfect weather prophecy. The storm fell as he foretold in the manner he foretold. Throughout the poem the analysis of the effects of the wind is not the less sharp and precise because the ode emerges from a depth of feeling rare even in poetry. It opens, we all remember, with autumn :

‘ O wild West Wind, thou breath of Autumn’s being ;
Thou from whose unseen presence the leaves dead
Are driven, like ghosts from an enchanter fleeing,
Yellow, and black, and pale, and hectic red ’ ;

and it ends with spring, when the east wind takes its place.

‘ If winter comes can spring be far behind ? ’ We feel in England of the west wind, even while it whirls the sere leaves to decay, that the promise of near spring is conveyed in the warmth of the air that it sweeps across the land off the surface of the western Gulf Stream.





FIELDFARES

THE STRUGGLE WITH COLD

(1) BY LAND

It is a pretty belief of the country people, and it is general, that many berries mean a hard winter. Such a thing is not impossible. It could be that weather of the sort to produce much fruit is a cause of other weather that includes frost; but there is no evidence for the truth of the belief. One year of astounding berry weather in this century was followed by a winter of quite unusual mildness. As often with country people, inherent teleology has been stronger than observation. The truth is that in England the harvest of berries is always large; and often lasts on until every fear is gone of the dearth that goes with heavy frost. But however open the winter, the favourite berries are always cleared off, and generally there comes a day when hunger or laziness compels an attack on the more bitter fruit. Every winter within the writer's experience a certain clump of holly bushes has been attacked and cleared of berries by a sudden onslaught in January. Several trees of the clump are female hollies, and thanks to their juxtaposition to the males they usually bear heavily. The groups of coral berries stand out very clearly from the metallic leaves, so clearly indeed that emissaries from Covent Garden, who now range the country at a radius of a hundred miles from

London collecting for the Christmas market, see them from afar and beg leave to purchase. But the berries are not designed for Covent Garden.

In the early winter not a single berry is touched, so far as one can see. Perhaps now and again a blackbird picks one off—a probability enhanced by the discovery of holly seedlings in one of the blackbird's favourite haunts. But the cardinal harvest remains apparently intact till a particular day. It is then attacked furiously by the fieldfares, and the whole cleared off in a day or two. It is difficult to determine the reasons of the sudden attacks. No doubt the holly-berry is bitter as compared with the hip, which is therefore preferred before it. But whether the birds are forced by necessity to take the less savoury food, or whether they wait till the berries are matured is another question. All the wild berries are softened and sweetened by frost and much weather. At Christmas the holly-berries are hard and shiny. After a week's good frost they mature, like celery, and the first birds to fall upon them are the congregated fieldfares, which travel further than our native birds in quest of food, and are much more dependent on berries.

All the thrush tribe are great berry-eaters; but the thrush itself is much more carnivorous than missel-thrushes, blackbirds and fieldfares. In fields where the May bushes are frequent you may almost catch blackbirds with your hands, so greedy are they for the hips. The time is a perfect one for watching the birds; you have only to stand still against the trunk or series of trunks of some thorn and watch. If it is very cold the fieldfares will crowd on the bush over your head, now and again dropping to the ground almost at your feet to pick up fallen fruit. Missel-thrushes prefer above all other food the berries of the yew or one of its varieties. Any one who plants a Japanese yew in his

garden may make quite sure of attracting the missel-thrushes. They make for the fruit more greedily than a tit for a coconut. The tree is a peculiarly difficult tree to perch upon, and in their greed they work noisily and clumsily. The only way they can pluck the berry is by fluttering violently opposite it, and now and again steadying themselves with their claws, but never perching. The difficulty is almost as great to them as to starlings which have been seen imitating the gulls in their art of picking food from the surface of the water. As they catch each berry they almost tumble down to the foot of the bush in their hurry to devour this most delicious food, as sweet to the human palate as to the birds. It is a lesson in aeronautics to watch the extreme difficulty experienced by the bird in flying straight upwards. The wings move at a frantic pace, and the whole effect is strangely laborious; but the greed for the berry is too great to allow the bird a thought of flying even a few yards off the tree.

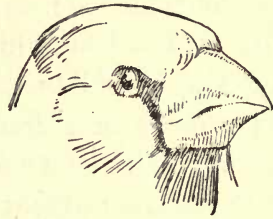
Naturalists have not very closely studied the feeding habits of our birds, or indeed other animals in winter, except in cases where they have some very apparent effect on cultivated crops. The Board of Agriculture itself has come forward to impress upon the community that the plover is the best of the farmer's friends, and that the starling is very little less useful. The crops of thousands of unfortunate pigeons have been examined; and though it has been proved against them that they will eat their fill of clover and succulent green stuff, they also swallow a good number of the bulbous buttercup roots and arrest the spread of most pernicious weeds. The Hungarian Government, through its well-equipped bird department, has justified the rook, that valiant destroyer of the click beetle, but confessed that when the numbers grow excessive the birds may degenerate, just as children in our

slums develop a taste for pickles. Indeed, birds very rapidly change their feeding habits if there is pressure. They will imitate, too, an individual who may show some morbid taste. Little colonies of rooks, as of brown squirrels, may turn into eaters of carrion.

It is curious that more is not known of the food of birds since classification began on the lines of the dietary. For as birds feed, so are their beaks shaped; nor is there any part of the bird which has been so affected by locality and habit. Compare the spillikin beak of the wren with the pearl pincers of the hawfinch, or the aquiline hawk with the rook, or the



WREN



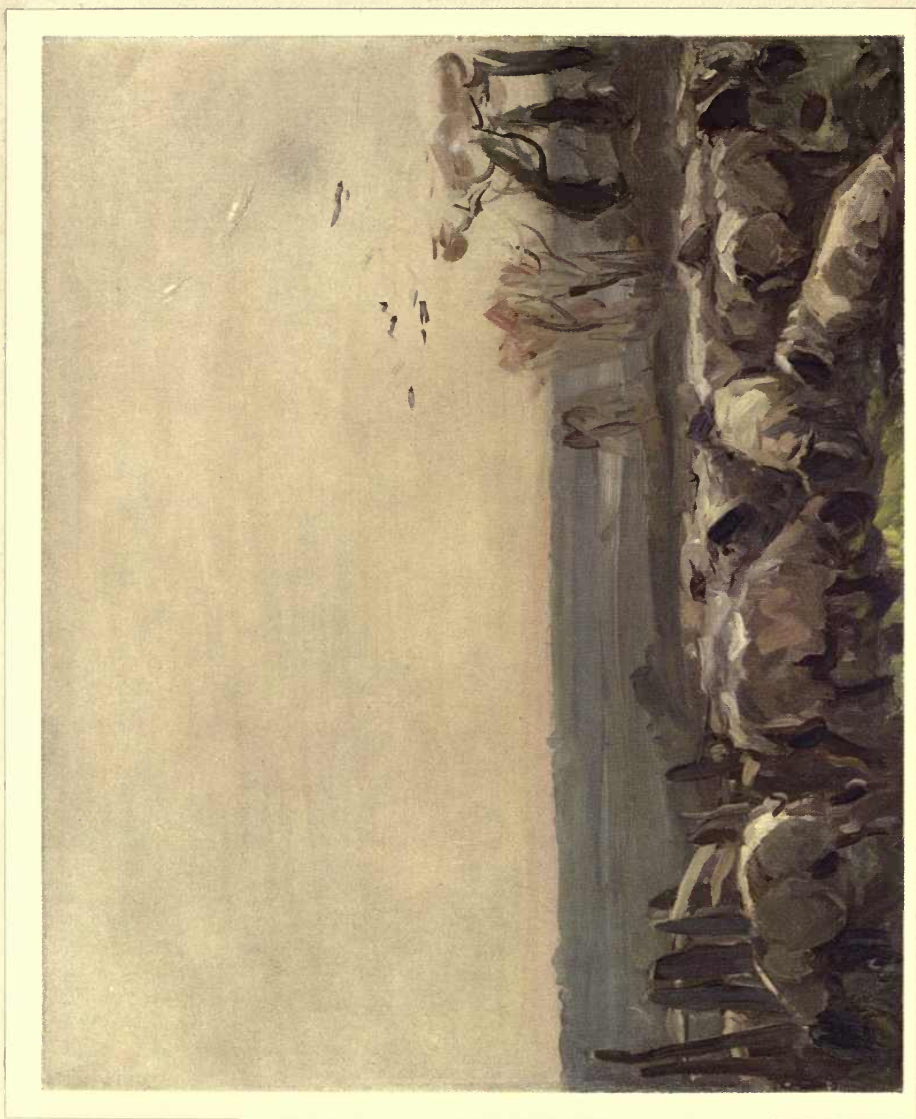
HAWFINCH

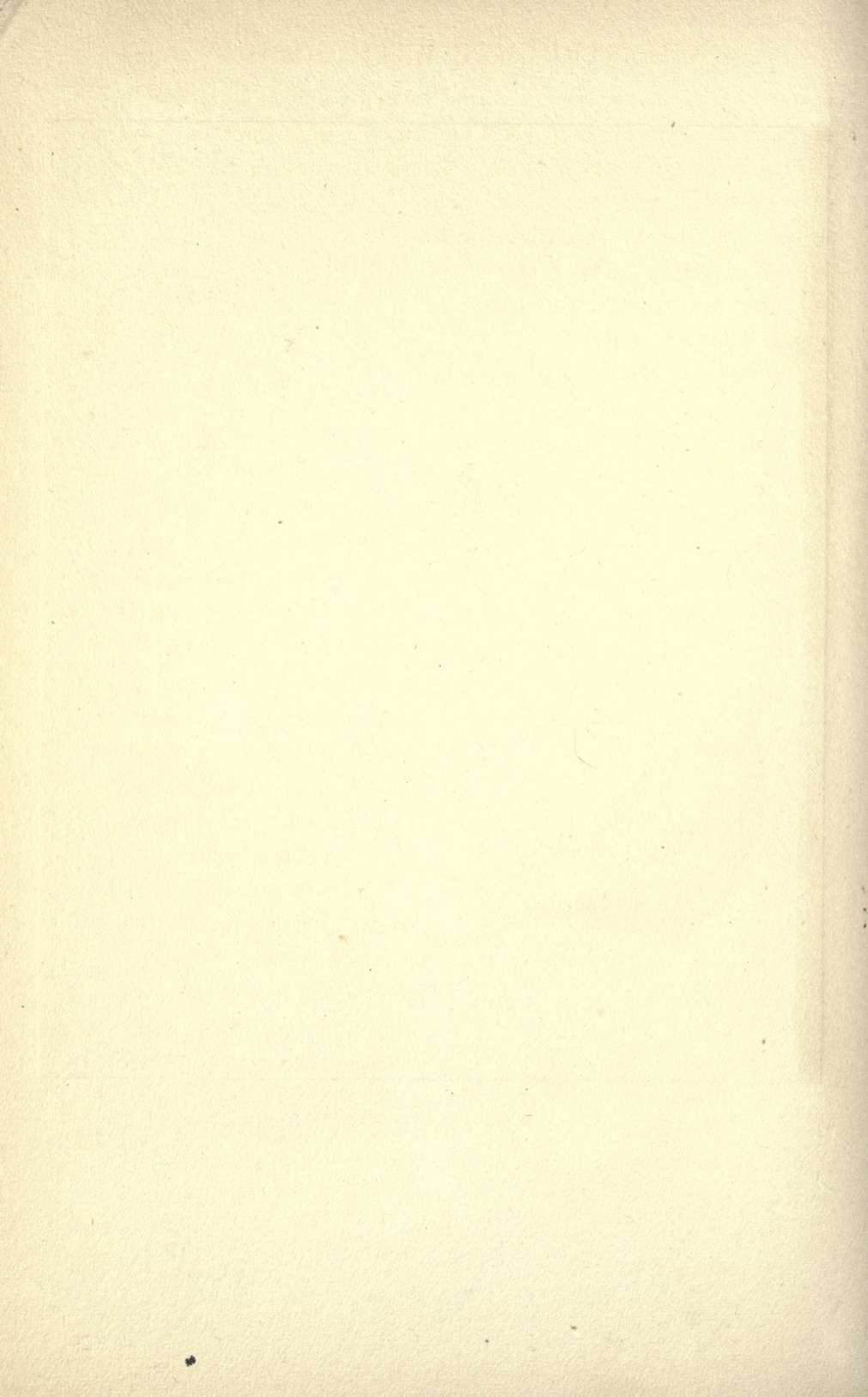
broad-based mouth of the nightjar with the awl of the woodpecker. In all these, and yet more clearly in the snipe and avocet, you could infer the feeding habits *a priori*. But the knowledge lacks precision as the aviculturists or keepers of captive birds have realised. Few field observers care to be aviculturists, but they are inferior to the keeper of caged birds in this department of knowledge.

We may be sure that the country would be overrun with certain weeds if many birds did not live principally on seeds. A type of the insect feeder is the goldfinch; and once again, after the lovely bird has nearly vanished, we begin to see their flocks swarming among the thistles. They become again part of the autumn landscape. Less conspicuously, but as surely, the other finches, the buntings, and our one warbler, the hedge-sparrow, are at work in thinning the

SHEEPFOLD
(CLOSE OF A WINTER'S DAY)

By HARRY BECKER

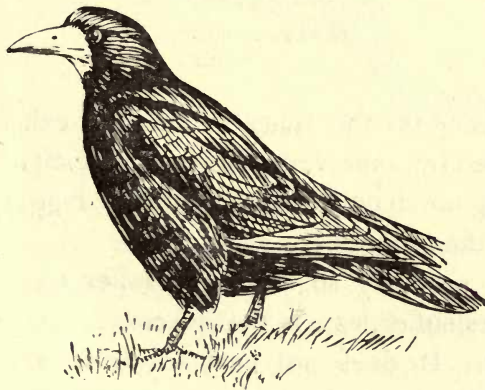




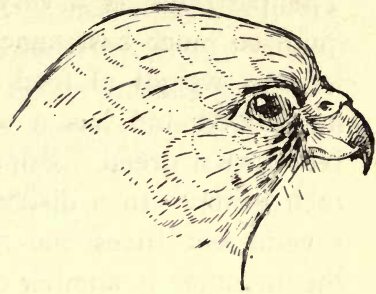
myriad seeds that are to be found in every single square inch of earth of open country. Other animals save their lives by reducing vitality. But birds, though they store fat within their bodies, and can thus bear some temporary starvation, must live the active life though the ground is iron with frost or blanketed with snow.

Among the birds that suffer most from want of winter food are partridges, though their case is seldom if ever quoted. All game

preservers feed their pheasants, spending often unheard of sums in this way; and of course the artificial multiplication of these wild fowl makes this quite necessary. But comparatively few pay this attention to the partridges, which deserve it more since they do little if any harm, while the pheasants do much. The partridge is essentially the bird of cultivated fields: the better the farming, the more the birds, it is said.



ROOK

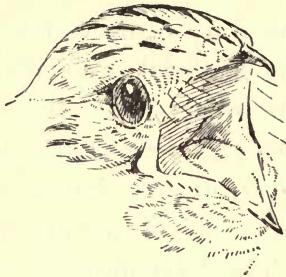


KESTREL

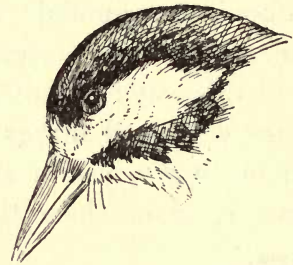
The stubbles are their feeding-ground, the grasses their sleeping-place, the south side of the hedgerows their siesta couch, the dust

of the roads their bath. When the stubbles are well gleaned and birds plentiful, partridges begin to suffer seriously towards the end of January. The theory is a personal one; but the dogma may be broached that scatter-

ing food for partridges through January, when the spring hunger begins, would do more to multiply the stock than many of the troublesome and expensive breeding systems. The partridge is a very heavy bird. It does not demand quite so much sustenance as the woodcock, which will eat its own weight of food in twenty-four hours; but it needs much food and has a wonderful instinct for its discovery. Not even a green woodpecker has a finer taste in ants and their grubs. In a district almost denuded of partridges by several wet Junes one field was found packed with birds, the day after a number of ant-hills had been cut open; and



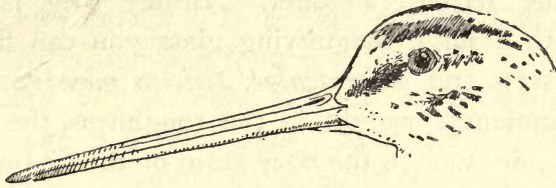
NIGHTJAR

GREATER SPOTTED WOOD-
PECKER

the birds remained clearing up the relics for many weeks. It is an odd fact, established by some very thorough investigations, that partridges living on chalk land are distinctly bigger and stronger on the wing than others.

The bird that, if one may say so, ought to suffer more than most others, but does suffer less, is the sparrow. It is essentially a grain eater. It does not care for fruit, and only eats live things during one of the spring months, but it is saved by its affection for the haunts of men and by the stackyards, where there is always grain. In the yards it is always associated with finches. Any one who likes to conceal himself in loose straw can watch the finches from a few yards or even feet; and if there were more stackyard

observations, there would be less written of the exceeding scarcity of certain birds. In Hertfordshire, for example, the brambling or mountain finch is usually common every winter. Large flocks appear in the fields now and then, but there are some specimens in the stackyards every year. Hawfinches, too, are common. Indeed, every finch is common,



SNIPE

the goldfinch and especially the bullfinch; and it goes without saying that greenfinches swarm. But none of them



AVOCET

except the greenfinch have the sparrow's fondness for human houses.

The most pleasing of all birds to watch in winter time is the jenny wren, though many people who enjoy their tits and robins immensely seem to forget all about it. The little things are even fonder of houses than sparrows or robins. With the slightest encouragement they will come into the warm rooms whenever the weather is severe, and they rejoice especially in a greenhouse. They creep in and about a honeysuckle on the wall, greenhouse plants, or the

base of a hedge, very much like mice, quick, quiet and busy. At every step or two of their running about they peck at the branches or plants, finding food quite invisible to our eyes. The little black eyes and the beautifully fine beak, pointed as an etching pen, discover and seize what no other bird cares about; and this form of food exists even in the hardest weather. If any twig is carefully studied with a huge magnifying glass you can find pieces of dead insects and *animalculae, disjecta membra* of incomparable minuteness, caught in the roughness, the crevasses of the bark, or stuck in the oozy resin of the fir twigs. The number of dead remnants of creatures is probably much greater in any glass-house, and the fact will account for the wren's noted preference for this winter feeding-ground. And the wren is prettier than any of the greenhouse plants. The delicate browns and greys of the bird outdo in comeliness the flame of the climbing geranium, through which it threads its dainty course. The black eye has a glint beyond the eye of the flower; and the sudden energy of its bouts of song in wintry weather have the impetus of a Shelley lyric.

Robins save themselves as sparrows do; but their case is worse. Above all other birds they are flesh feeders. Their courage and energy are the courage and energy that, as some philosophers consider, are a consequence of a flesh diet. Insects and grubs and worms are harder to come by even than grain, when winter lies heavy on the land. So it comes about that each robin absolutely demands an area to himself. He will not permit any other robin, even his own child or parent, within that area; such is the stark law of self-preservation. It is therefore quite difficult, however thorough the supply of food, to attract to your window more than a robin or two, while as many tits will come as you find

supplies for. Of all the birds that fly the robin is perhaps the most solitary.

The least solitary are the starlings, whose vast throngs, shifting the light as they manœuvre this way and that, are one of the most familiar of winter sights. It is always laid down as a maxim that birds congregate and mass for the sake of food-supplies. It is true enough that partridges pack most in years when food is scarcest; but it is difficult to understand why each bird finds it easier to discover food when he is one of a great pack. Starlings and larks, which cover our fields in winter, have rather changed their feeding habits since they became so numerous. You may see fields in Norfolk where the starlings have fairly devoured the whole crop of wheat. They scratch at the foot of the blade and bite it off about a quarter of an inch below the top of the bleached part. Where birds, taken with a fancy for this unlikely food, have descended in a harpy spirit, farmers have been forced to sow the field over again. So here and there, walking over the winter fields, one may find patches scabbled over as though a hen had been scratching, and the wheat over the patch looking a rather melancholy spectacle. It finally recovers to some extent, but it is not a sight that helps the farmer to appreciate his birds. The offender in this manner is always the lark, whose numbers after the winter migration are portentous. But both birds, especially the starling, are, like most other birds, notable benefactors. What they prefer to eat are the grubs that live at the bases of the plants. They are scavengers and sterilisers, a potent ally, except when the numbers grow excessive. Both the starlings and larks suffer excessively in very hard weather; and multiply exceedingly after a course of open winters.

(2) BY THE SEA

Few birds have more difficulty in getting food than the gulls. They seem to have no proper home. The black-headed gulls, the species chiefly frequenting London, cannot get a living at sea, which is their proper home; and they do not seem particularly well fitted for life on land. They flock to the ploughs as soon as harvest is over, tumbling over one another in their greed, and often fluttering and 'scrabbling' within a yard or two of the ploughman's back.



'THE GULLS PRESS AND SCRAMBLE CLOSE BEHIND THE PLOUGH'

They come yearly in greater numbers to the river-side towns, and though one regards them by the sea as the wildest of birds, expressing wildness in the strange cry that seems taken from the tempest, they are grown so tame that they will feed from the hand and can be captured—*experto crede*—by the hand. One may say that the whole tribe of gulls are in a manner parasite. The skua gull, of course, largely lives by stealing, by robbing other birds of the fish they have caught, just as in America the eagle will rob the fish hawk. The greater black-backed gull is a murderer. In the realm of nature it is seldom if ever that a more brutal sight is vouchsafed than this gull attacking a laggard or a wounded duck. There is savagery in the impetus of the onset. The beak is driven as if it were a sword into the screaming bird,

and the feast is begun before the bird is dead. Round the harbours every variety of gull is busy picking up any refuse ; and perhaps after all the proper work of the gull in the economy of things is to scavenge, to eat up scraps, even to play the vulture. For this task they are made omnivorous. They swallow the bread we give them on London embankments as eagerly as they pick garbage on the river.

But the gulls, a various crowd of great multitude, are best seen at their work of scavenging along the coast. It is the great feeding-ground of winter, and its importance may best be realised when the great shoals of fish begin to approach the land, especially when, late in autumn, there come into east coast waters huge shoals of silvery herrings, and sea-going fishermen begin the harvest of the sea. It is a pleasant sight when the day is bright to see the long processions of sturdy steam luggers passing in and out the harbour. Those with catches push their way vigorously towards the port. Others just away from the wharves and quaysides, slushed down and freshly cleared of fish scales and the bloody drip of yesterday's catch, race each other to the herring grounds, with nets ready to be shot for the night's fishing.

On just such days as these the waves fling upon the strand queer things which have dropped from the nets, besides strange creatures churned up from the depths. Above the waters flocks of gulls scan with keen yellow eye the flotsam flung from wave to wave. These welcome morsels may be broken fishes, or sea anemones ripped from weed-grown wreckage sunk in the shallows hard by some treacherous sandbank. Often the larger gulls snatch up from the sea the bedraggled carcass of some small drowned migrant bird—a skylark or a chaffinch, overcome by an adverse wind, or starling, maimed by striking a lightship's lantern. The

gulls are of many varieties : the dark mantled greater black-backed gull, the blue-legged common gull, the smaller black-head, distinguished now only by two dark ear spots, and by its bill and legs of crimson, and the herring gull, with pale blue back and pinky feet. But young birds of the year, of the larger species, clad in freckled greys, muster up in vastly larger numbers.

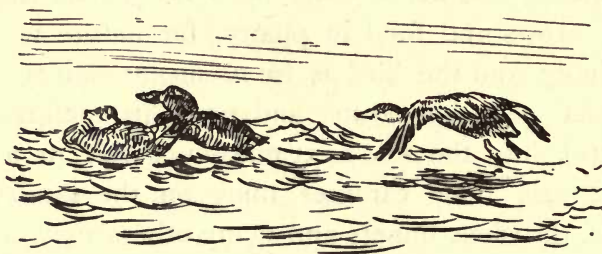
There is often much of interest to be noted at the tide-mark. You may find the long ribbon-like streamers of the sea-tangle, the olive-brown fronds of the serrated wrack, the bladdered fucus and the oar weed—this last often attached to a valve of the horse mussel ; whilst star fishes, the weed-like corallines and zoophites, lumps of the egg-cases of the whelk and feebly struggling pear-crabs, with rarer and even more interesting products of the sea, go to swell this ‘margin of all things vile.’ Sometimes the scouring underwash lays bare the delicately brown shells of the radiated trough shell, the long fingerlike razor valves, and hermit crabs robed in discarded shells of whelk, casting them up with the rest to the delight of the sea birds. Amongst the debris one often finds numbers of herrings, the more or less putrid carcasses of the largest fish, whose weight caused them to drop back from the meshes of the nets. With them dull-eyed mackerel, victims also of the nets, and, maybe, weevers, and here and there a whiting, and among them the picked or spiked dog-fishes. Often we find the wicked grey eye of this little shark still glistening. It is an interesting experiment to dissect them. As often as not you may turn out from a sea-dog’s stomach, chestnut-shaped pieces of herring—always of the largest and best, the fisherfolk will tell you—which they had bitten from the dead fishes as they hung suspended in the vertical nets.

That large-eyed fish, the scad, or horse mackerel, often

as fresh as if but just dead, may be found stranded on the shore. Neither fisherfolk nor landfolk in East Anglia seem to care for him, though he is attractive to the eye, with cuirass-like scales adorning his lateral line, and with his great bright eyes. But the hooded crow does not despise him. Planting a big black foot upon the stranded fish, he gouges out first one eye, and then the other, and as deftly disembowels it. A few pieces are snatched from the back, when a fellow-bird calls to its companion. Away flies the crow to help a comrade who has just discovered a cast up baby porpoise, another derelict from the fishers' nets. At times the crows find food in plenty, for nature is cruel as well as kindly, and the bird is by no means dainty. When the night has been boisterous, and poor little migrants have been beaten into the sea, next morning's tide, or a tide or two after, sees their carcasses flung on the sands: larks, blackbirds, thrushes, linnets and many others, may be among them. Even rooks so perish. It is quite a common thing in late autumn to find the breast bones of various birds clean picked a few hours after some sea-storm. One has found the gull and the gannet, and many a guillemot, razorbill, and little auk's skeleton entirely fleshless, with perhaps only the wings intact, and when they are hard pressed by hunger the crows have been again at these sorry remnants, striping off the tougher muscles of the wings that they had rejected. At a pinch the candle ends and dead rats and mice from the sewers are greedily devoured, nor will the hungry tribe despise a stranded turnip or a broken cocoanut, soft and putrid though they be by long submersion.

When the east wind long continues, and the sea-fishes leave the shallows for deeper waters, the commoner auks, the guillemot and razorbill, fare badly. These birds revel in

the herring shoals far out at sea, and with gannets that plunge, and cormorants and shags that dive, they share the fishing-grounds with the fisherfolks and the gulls. The gannets may need ten fishes a day, the cormorants as many, and the auks can safely do with half a dozen. The gulls by thousands harass the shoals, unable to dive, depending more upon the fishes gilled high up in the drifting nets, to the disgust of the rightful owners. Often these various birds gill themselves in the nets and are drowned. But when the herrings swim low, the guillemots especially suffer sadly ;



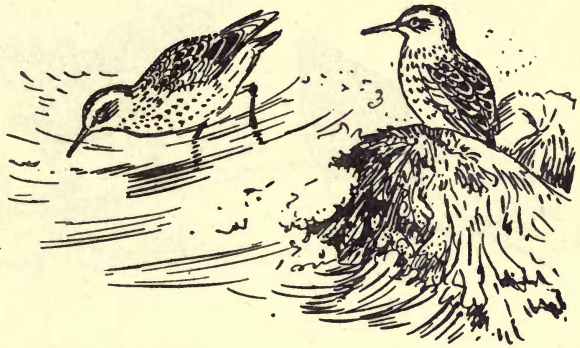
SCOTERS

and, flung from wave to wave, after becoming wearied out by constant diving, and by plunging through the rollers, by and by the breakers cast them dead or dying on the beach. It is no uncommon thing for the rambler on the shore to find a guillemot bunched up as if sleeping just above the margin of the highest wave, and, on stooping to pick it up, to find it dead and stiffened. More rarely the razorbill suffers with it. Life is harder for the birds of the sea, though the sea is unfrozen, than the birds of the land. For by the sea there is always the winter of heavy winds. But not only sea birds come for a space to find food by the sea shore.

Among the least restful flocks are scaups, wigeon, tufted ducks, and shelducks. The black-plumaged scoter, the 'mussel duck' of the east coast fowler, hardy and vigorous

of wing and foot, seems not to heed so much the fury of the elements. Its home is on the sea, its food abundant in the quieter deeps below: it is an excellent diver, and searches diligently for the fat, brittle-shelled trough-shell and the smaller mussels, nor are small crabs and kindred crustaceans despised by them.

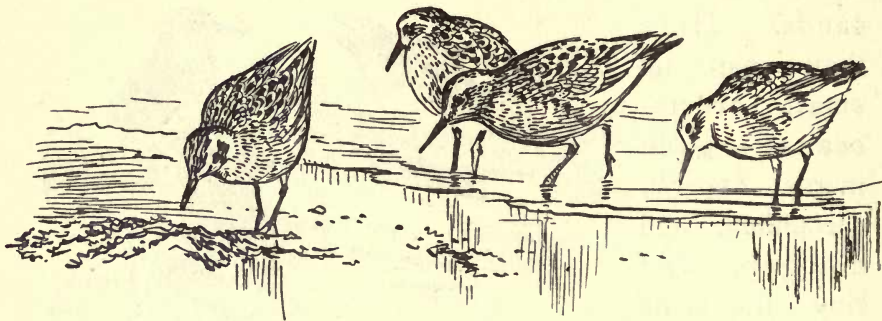
Running nimbly along the moistened sands various shore birds hunt for such fragmentary or minuter forms as the larger birds reject. Dunlins trot in zig-zag fashion up and down the wet sands. Here they snap up small crustaceans: — gammarus, hyperia, corophium, and crangon, and tiny fragments of other animal bodies.



THE PURPLE SANDPIPER . . . WILL RUN DOWN A RETREATING WAVE-WASH, THIGH DEEP

Occasionally the purple sandpiper may be met with: preferring rocky beaches and the neighbourhood of fucus-decorated piles and boulders, they will search the flattened stretches of sands, and, being daring, will run down a retreating wave-wash, thigh deep, in order to snatch up any tempting morsel. One seldom sees two together, less often a trio of this solitary species. Knots tamely prick about among the weeds and shingle, hoping for sand-hoppers. Ringed plovers in scattered companies search the drier stretches above the tide-mark, and occasionally a parcel of grey plovers, now clad in wintry vests of white, drop in to share the findings of the smaller birds.

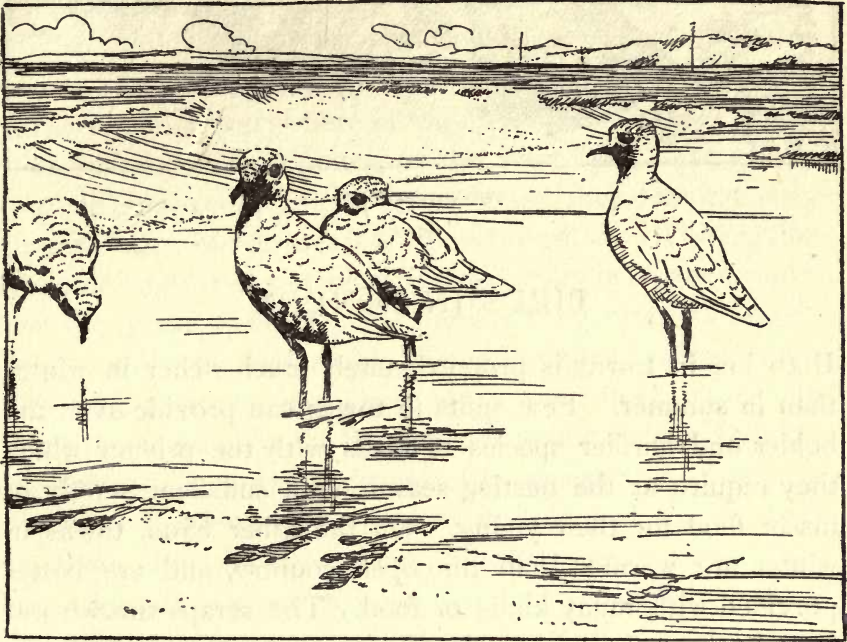
On the shingle patches high above the highest wave-sweep of the spring tides flocks of snow buntings, tinkling their bell-like note as they flit from spot to spot, explore the brown sands. Their quest is the buried and unburied seeds of the dune-plants that the wind and the drift sand play hide-and-seek with,—the seeds of maram and sand-sedge and the low-growing vegetation that bloomed and seeded last autumn, and dispersed, leaving an earnest of vegetation for the spring to follow. The naturalist and the bird-catcher



KNOTS

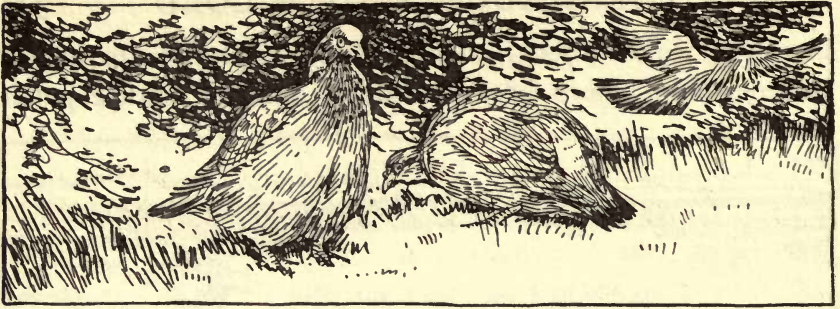
who lays his nets hard by the sand dunes recognise occasionally among their flocks the hardy Lapland bunting, the snow-bird, and the shore-lark. Happily these bird-catchers, the greatest of all enemies of our rarer birds, are beginning to decrease. Then there are grey linnets trooping southwards, resting and feeding as they travel, twites and redpoles—the lesser and the mealy—appearing in twittering, dancing flocks, keeping to the coastline, having arrived, perhaps but a day or two since, on the Norfolk coast. In January 1895 a later migration sped them in astonishing numbers before a spell of exceedingly wintry weather. It is horrible to record that one bird-catcher netted 70, 130, 220, 330 linnets in four successive days. When bad weather set

in in the winter 1900-1 another netter captured 140 siskins one morning before breakfast on a decayed lettuce patch



GREY PLOVERS ON MIGRATION

within rifle shot of the sea. It is on this coast that we most need the efforts of the Royal Bird Protection Society.



WOOD-PIGEONS

BIRDS IN LONDON

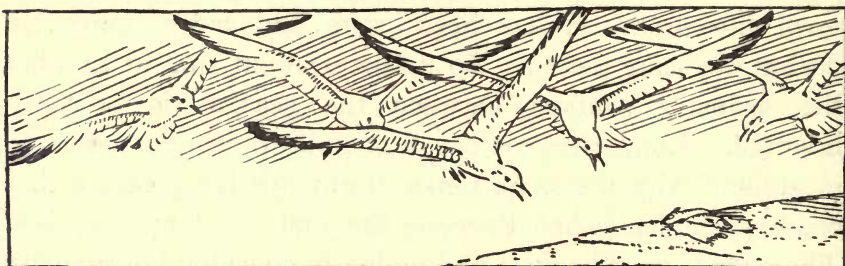
BIRD life in towns is proportionately much richer in winter than in summer. Few spots in towns can provide even the bolder and hardier species of birds with the privacy which they require at the nesting-season, or a sufficient supply of insect food for their young. On the other hand, towns in winter are warmer than the open country, and are better provided with many kinds of food. The scraps thrown out from houses, whether accidentally or in deliberate charity to the birds, are naturally more abundant; and even in days when motor traffic is so largely ousting the horse there is still a good deal of corn to be picked up by pigeons and hard-billed birds of the finch tribe in mews and stableyards and about cab-ranks.

The larger the town, the greater is the difference in the richness of bird life at the different seasons; and it is greatest of all in London. There, for the last twenty years, the winter birds have increased even more remarkably than the summer birds have diminished. As the suburbs spread annually wider and wider, the summer migrants seem less and less inclined to penetrate their murky barrier into the parks and gardens of the centre; and for a long time past the trees and undergrowth in their old haunts have been

growing sicklier and more decayed. It is doubtful, for example, whether the spotted flycatcher has nested in Hyde Park or Kensington Gardens for some years past, though it did so until quite recently ; and the same process of diminution or disappearance is noticeable in the case of the summer migrants almost everywhere in the metropolitan area. Birds which visit London in winter, on the other hand, have grown far more numerous ; and in some cases they are not only winter visitors, but residents all the year round. The regular arrival of large flocks of black-headed gulls in autumn dates from the great frost of 1895 ; and the increase of wood-pigeons, with the remarkable change in their habits which town life produces, has been more and more noticeable during the same period. So it comes about that in London the ordinary contrast between the seasons is precisely inverted. Londoners see the first gulls return to the river in autumn with the same sense of anticipative pleasure that countrymen feel when they see the first swallow in spring. The gulls begin to return to London in considerable numbers about the third week in October, though a few immature or unmated birds may be seen as stragglers in August, or even earlier. Their date of migration to their winter home is thus about a week later than that of the swallow and many other summer migrants ; but it is part of the same great movement. By November they have fairly settled down for the winter ; and they depart about the third week in March, or a little earlier in a very open season, leaving a few stragglers behind them. Their numbers vary a good deal according to the weather ; after hard frosts or violent gales, the flocks wheeling and screaming at the parapet of the Thames Embankment are twice as numerous, and twice as hungry, as in spells of calm. They feed to a great extent on what they can find on the surface of the river and its foreshores,

and on the lakes in the various parks. But their skill in catching bread or fish thrown to them in mid-air makes them favourite pets with Londoners ; and a flock of gulls wheeling with harsh screams in an endless circle past a figure on the wet grey embankment is one of the most characteristic pictures of outdoor London life. They will alight a moment on the parapet with wary eyes, and carry away a crust to consume as they float on the stream ; and sometimes they will even feed from the hand.

Black-headed gulls make up the vast majority of the birds of their tribe which visit London. Occasionally the



much larger herring gull is seen floating warily in mid-stream, or a common gull flits among the barges on the river ; but neither, so far as we have seen, is ever confident enough to come and catch food thrown from the Embankment, far less to take it from human hands. Herring gulls in the adult plumage of soft grey and white are much scarcer on the Thames than young birds in mottled suits of grey and brown. Among the black-headed gulls there are always a large proportion of birds in similar mottled plumage ; and it is not until the early weeks of the new year that the old birds gradually assume the sepia mask of their spring plumage which gives them their commonest name. Earlier in the season they have only two faint dark bars on the head, one across the

orifices of the ears, and one further forward. The dark patch is confined to the front part of the head, and does not extend over the crown to the nape of the neck, as is the case with the jet-black caps of terns. Black-headed gulls are also called laughing gulls, from the resemblance of their repeated cries to sharp laughter when they grow violently excited at any disturbance of their nesting colonies, or when they are being fed on the Embankment. All the gulls are eager and aggressive birds; but only the black-headed gulls have so far adapted themselves with confidence to London life. Their aggressiveness is very conspicuously displayed towards the ducks in St. James's Park. When food is thrown from the bridge to the mixed flock of waterfowl beneath, the gulls hover with threatening cries above the swimming pochard and wigeon, and often force them to drop what they have secured. Beneath the water the diving ducks are their masters; but we have seen a tufted duck bring up sprat after sprat from the shallow bottom of the lake, only to be robbed of them by the gulls as soon as it appeared on the surface. The gulls play pirate with the ducks' lawful gains, much like Arctic skuas with the earnings of other gulls. It is surprising to see the ducks victimised so easily by smaller and lighter birds; but the gulls win by sheer force of courage, though it is courage in an unamiable shape. The courage and intelligence displayed by the black-headed gulls in London is only one form of the vitality and adaptiveness which characterises their whole family. Gulls are a rising race; in many parts of the country various species are multiplying greatly under the protection of the Acts, extending their range to districts where they were formerly unknown, and developing new and mischievous tastes in diet.

In all these respects the wood-pigeon is the gull's counterpart on dry land. Wood-pigeons also have enormously

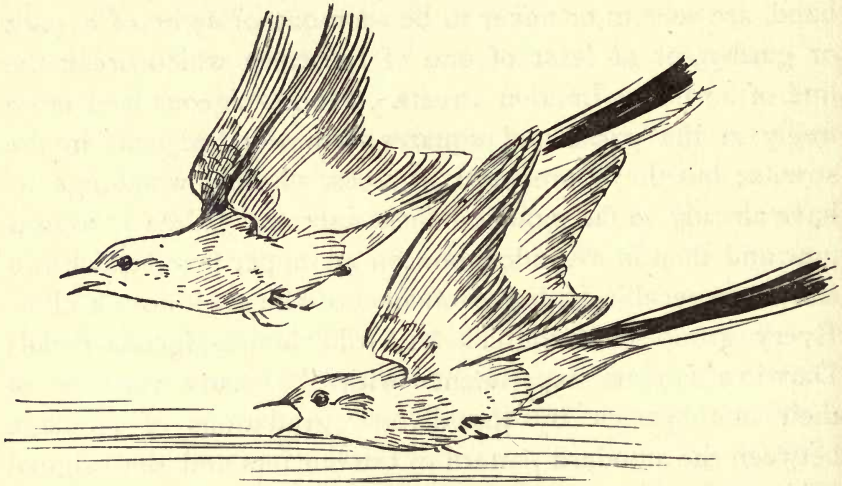
multiplied, have followed the spread of plantation into new districts, have become a positive curse to the farmer, and have added themselves as a new and delightful feature to London life. London has had its wild house-pigeons probably from time immemorial; Stowe, the Elizabethan antiquary, shows us how they were household words in his day by his story of how the boys of St. Anthony's Hospital used to call 'Paul's pigeons' after the St. Paul's boys in the street. They would respond with a cry of 'Anthony pigs,' and then both sides naturally fell to fighting. But the white-necked, portly London wood-pigeon is a colonist of much more modern date. London wood-pigeons are believed all to be descended from a few pairs turned out in the grounds of Buckingham Palace by the late King when Prince of Wales. In the country they are among the wariest of birds; in London they show the same intelligence by presuming to an almost ludicrous extent on man's friendliness. Swollen to an enormous size by inactivity and good living, they will scarcely step out of the way of the nursemaids' perambulators in the parks. Yet they have not lost their cunning, when it is needed. We have watched a half-grown Persian cat stalking a large and placid wood-pigeon in a little garden abutting on one of the London parks, until it seemed as if the cat's fierce concentration must win its prize, and the pigeon's indifference prove fatal; yet just at the right moment, with one more sidelong glance of the complacent eyes, the bird flapped gently over the fence, and the cat was left petrified and glaring.

It is remarkable how the distinction in the natural habits of the two kinds of common London pigeons still persists in spite of the great change in the birds' present life and surroundings. The pigeons of St. Paul's and the Royal Exchange and many other London buildings are descendants

of escaped house-pigeons, and thus ultimately of the wild blue rock-dove, which still haunts some of the wildest cliffs and caves on the coast and inland. They nest and roost, accordingly, in the streets which are like deep ravines, and on the tall buildings which recall the lofty cliffs. The roar and flow of traffic far beneath them is curiously like the movement and murmur of the sea, when heard and seen from one of their lofty watch-towers. Wood-pigeons, on the other hand, are seldom or never to be seen out of sight of a park or garden, or at least of one of the trees which break the line of so many London streets. House-pigeons feed more freely in the parks and squares than wood-pigeons in the streets; but they never nest in trees, whereas wood-pigeons have already so far modified their ancestral habits as to nest now and then in a window-box on an upper floor, which is a site more recalling a ledge on one of the rock-dove's cliffs. Every group of London's half-wild house-pigeons recalls Darwin's famous experiments with the many varieties of their one species, by the diverse gradations of plumage between the standard pattern of the fanciers and the original wild stock with its characteristic dark wing-bars. The perpetual tendency is to revert to the original type; and if it were not for perpetual new recruits of strange hues and shapes from the pigeon-cotes, in a very few years the whole race of London house-pigeons would become pure blue rocks again.

Grey wagtails are far less numerous than black-headed gulls, but equally regular as winter visitors. Wagtails are often badly named; the name of yellow wagtail is reserved for a summer migrant, and the name of grey wagtail is given to a bird in which yellow is even more conspicuous, while the common grey member of the family is called the pied wagtail. Pied wagtails may be seen now and then in the parks or along the river at most times of

year, but especially at the two migration times, when they sometimes appear in little flocks. Grey wagtails, with their beautiful glint of sulphur yellow beneath the tail, are winter birds in London and other parts of the south and east of England, whither they almost all migrate in late summer from the hill streams of the west and north, where they breed. They may be seen along the Thames in London from about the beginning of September to early March.



GREY WAGTAILS

Occasionally they are found resting in some City garden or churchyard, or on some high ledge of a building in the middle of the most densely overbuilt areas. Sometimes they appear in pairs, even in the autumn and early winter months, when birds' family ties appear loosest; but usually we see single birds scattered here and there along favourite reaches of the river. One of their most frequented haunts is off the Chelsea Embankment, where they can find rest on certain floating timbers when the shore-line is submerged at high water. At all states of the tide they can often be seen flirting their yellow tails, or flitting with their sharp double call-note,

along the riverside at Chiswick Mall or Strand-on-the-Green. Unable to rest on the water, like the gulls, they are less at home on the river between Westminster and St. Paul's; the noise of the traffic and the absence of any convenient resting-place at high water keeps them restless and timorous, and they flit uneasily over the plane-trees and across the river with an anxious cry. Often this familiar call first draws attention to their slender forms as they waver across the wide brown channel of the river. There is a strange contrast between these London scenes and the shores of the mountain torrents where they are familiar in the summer half of the year.

Brown owls are chiefly winter visitors to the more central parts of London, though one or two pairs may possibly still remain to breed. They are sometimes heard in spring and summer within a mile of St. Paul's; but these may be unmated birds. For many years in succession a large hollow elm in the northern part of Kensington Gardens was tenanted every winter by a brown owl, which arrived in autumn and left again in spring. The ground beneath the tree was littered with numerous undigested pellets, each of which contained the bones and feathers of a sparrow neatly packed up. For the last few seasons there has been no sign of this tree being tenanted; but owls are still often to be heard in Kensington Gardens and Holland Park, and are occasionally seen perched among the branches by day. Brown owls feed chiefly on small birds, and thus find a plentiful source of subsistence in the London sparrow-flocks; but white or barn owls live chiefly on mice and young rats, caught in the open, and are therefore seldom seen or heard in the central parts of London, though they are not very uncommon in the suburbs. The peril of owls in the dark may be one reason why London sparrows are fond of roosting in trees which are lit up all

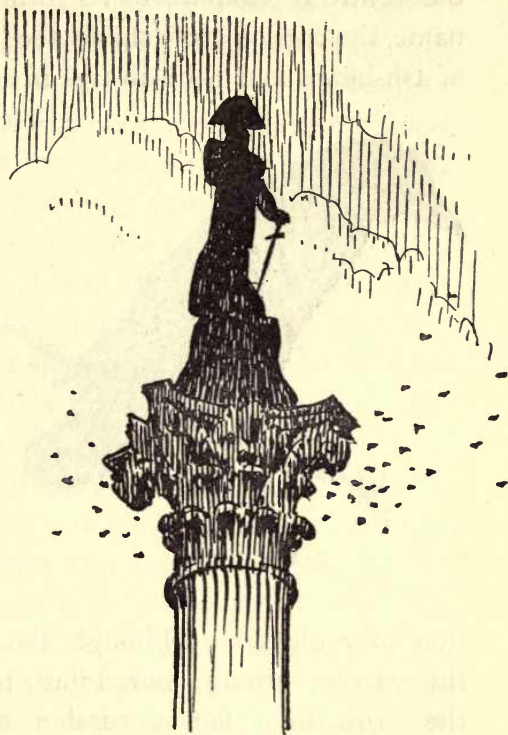
night long by the full glare of the street lamps. One such roosting-place is in a group of three plane-trees on the little plot called Knightsbridge Green, at the eastern end of the Brompton Road. Here they assemble every night to sleep in a situation which would effectually banish slumber from birds less inured to city life. For many hours the full roar of the traffic of one of the most crowded London thoroughfares rises just beneath them ; and in winter, when the boughs are bare, the arc-lights dot the pavement with the shadows of the birds' clustered forms. Large flocks of sparrows also roost in thick clumps of trees in some of the parks. Here they find protection from marauding owls among the dense boughs, as well as shelter from the cold in winter. The chorus of harsh chirping with which they settle down for the night is a peculiar sound at twilight in the parks, where the comparative silence makes it most conspicuous.

Often the same roosting-place is frequented by a flock of starlings ; and then the chirping of the sparrows is almost drowned by the starlings' more strident cries. By day the starling is far less conspicuous than the sparrow in central London ; it principally feeds on the turf of the parks and suburban fields, and has not the capacity of the sparrow for picking up a living in any gutter or alley. But certain spots in the middle of London have been chosen by starlings for the site of their great nocturnal gatherings ; and their assembly a little before sunset is a most remarkable feature of London bird life. In October and early November, before the leaves fall, one of their chief stations is among the planes of the Temple ; but the most interesting sight of all is to watch them alight on the capital of the Nelson Column in Trafalgar Square. As dusk begins to fall, every few seconds flocks and small parties of starlings come flying in high above the house-tops to their lofty perch beneath Nelson's statue, chiefly

from some northerly quarter. Hundreds of birds vanish among the carved foliage of the capital; but only a small number leave this cold and windy height, and seek a shelter more in accordance with their usual habits in the thickets on the island in St. James's Park, which is another of their favourite roosting-places.

By the time that the sky is dark, and the glare of lights rises from the streets beneath, the movement of the flocks has ceased; and to all appearance the great majority of the birds spend the night in this lofty watch-tower.

Many people who know birds well in the country are astonished at the commonness of the carrion crow in the whole London area. It has an air of wildness which seems to make it unsuitable for London life; but in reality its habits are better adapted to life in towns and suburban market-gardens where there is no game and few lambs or poultry, than to the modern countryside. In many rural regions the carrion crow is now practically extinct. These are the districts where game-preserving is strictest. There is no such intelligent and ruthless enemy of the eggs and young of most other species of birds as the 'corbie'; and his habit of attacking young or weakly lambs makes him as well hated by the



shepherd as by the gamekeeper or the poultry-farmer. Both the bird and its nest are conspicuous, and it is not difficult to banish the species from any well-watched region. But in London and its suburbs the carrion crow has few enemies; and his boding caw and lean sinewy form are familiar from the centre of London to its furthest outskirts. True to its name, the carrion crow chiefly feeds in London on the garbage of ash-heaps and rubbish-tips in suburban wastes, and on the



CARRION CROW

dead animal matter which it finds on the shores of the river and the large suburban reservoirs. It will also steal eggs or kill young birds when it can. The prevalence of the carrion crow in London is one reason of the diminution of its more peaceable cousin, the rook, just as the diminution of crows has led to the multiplica-

tion of rookeries. Though the rook sometimes develops the carrion crow's marauding tricks, it is no match for the crow in a family tussle; and crows are dangerous pests in the neighbourhood of any rookery. Rooks are now very scarce in central London; besides the small rookery in Connaught Square, on the north side of Hyde Park, which is only irregularly occupied, their only surviving colony is the famous rookery in Gray's Inn. A few years ago this was nearly wiped out by the raids of carrion crows, and the rooks were only saved by the forcible expulsion of the robbers. But crows incur little hostility elsewhere in London; they occasionally breed even in Kensington Gar-

dens, and often in the oaks and elms of suburban fields. They are long-lived birds, so that their numbers are not dependent on numerous families; and it is probable that they are recruited from time to time by refugees from the country. Their snarling caw is a very familiar sound in all parts of London, especially in early spring, when they wander about the town in quest of attractive nesting-quarters. The jackdaws which still frequent one corner of Kensington Gardens are manifestly afraid of them; and they are great pests to the waterfowl which breed on the lakes in the parks. But they are a bold and interesting feature of wild life in London; and their lean forms hunched on a tree-top bring welcome associations of the lonely marsh and mountain to many prosaic squares and dull riverside fields.

Missel-thrushes are common now in London in the same weeks of early spring when the crows go cawing and wandering from park to square. They have a regular habit of settling close to houses for the nesting season, apparently for the purpose of seeking protection from the crows. In the country crows usually avoid the near neighbourhood of man; and the discovery that this rule does not apply to London is very likely the reason why missel-thrushes seem never to nest in the central parks and gardens, though they often appear in them for a few days in early spring. They visit Hyde Park from time to time, and almost outsing the song-thrushes; and at the end of March 1909 a missel-thrush settled for two or three days in Lincoln's Inn Fields, and sang so loud and sweetly at dawn that wondering sleepers put out their heads to listen. But the singer found no mate, and departed for fields which were wider. Song-thrushes and blackbirds are permanent residents in all the parks and many of the larger London gardens, and sing with as much freedom as the birds on any country lawn. Birds attached to a single

spot generally sing earlier and more vigorously than their wandering kindred; they are free from the hardships and distractions of a vagabond life, and pair and breed earlier in spring. The song of the thrushes in December fills Hyde Park with a sense of spring in spite of its grey fogs; and they are unusually musical in and about the Zoological Gardens, where they can pick comfortably among the pens and shrubberies, and prosper on fragments of bun. Blackbirds are heard in London in March more often in proportion to their numbers than in the country. The plague of cats makes it difficult for London thrushes and blackbirds to bring up a brood in safety, but otherwise their life is a comfortable one. Robins are bolder birds than thrushes and blackbirds; but they are less numerous in London owing to the scarcity of secure nesting-places. They naturally build in open holes on sloping banks, within a few feet of the ground; and such sites in London are perpetually exposed to the attacks both of cats and rats. Robins are birds of woodland tastes, for all their familiarity with man, and cannot make themselves at home among chimney-pots and paving-stones, as the sparrows do. Hedge-sparrows are rather commoner than robins in the London parks; and this seems due to their habit of nesting in thick bushes, which protect them better from their four-footed enemies. From early autumn until summer, the sweetly piercing song of the robin can be heard sparingly in the more thickly grown portions of the London parks, and in some of the gardens and squares; but it is less constant, especially from January onwards, than the shriller and more laboured ditty of the hedge-sparrow. Chaffinches are no more than occasional visitors to central London; though they are not uncommonly seen or heard among the park trees, they are unlikely to be found in the same place next day. Since they abound in almost every country district,

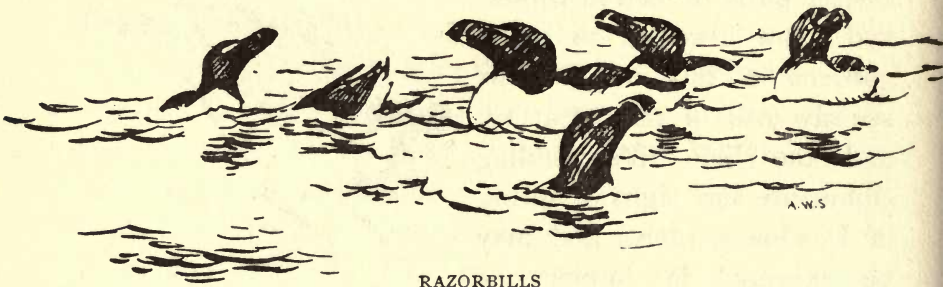
and thrive in high-lying villages which even the sparrows avoid, it seems curious that they do not settle in London. But they are so fresh and dainty in their plumage, and the fashion of their nests, and all their movements and ways, that one suspects that they cannot tolerate the London grime. Titmice, and especially the great and blue tits, are common in many small gardens as well as in the parks. Their searching ways make them at home in a small plot, while they nest safely in small holes either in trees or walls, or even in iron lamp-posts. They are also among the easiest birds to feed in winter, and grow attached to many gardens in this way. The see-saw call of the great tit, and the blue tit's tinkling chime, are sure signs of spring in London gardens, and may be expected in January or early February between the songs of the song-thrush and blackbird. The little grey cole tit, with his white stripe dividing his black cap, is less common in central London than towards the outer fringe.

Besides the birds which are residents or common visitors, it is surprising how many others can be seen from time to time even in the more central districts. The great opportunity for seeing rarities is in the early morning in the parks, especially during the spring and autumn migrations. Kingfishers, sandpipers, wheatears, reed warblers, and many other fairly scarce or local species are frequently reported in this way from Kensington Gardens and Hyde Park. As the morning stream of workers begins to pour along the paths, most birds grow scared and pass on, so that they are seldom



BLUE TIT

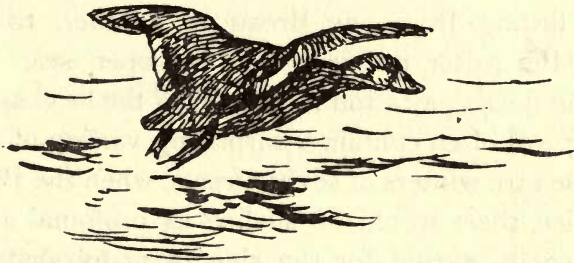
to be seen later in the day. The moorhens and dabchicks and mallard on the park waters are recruited on the spring migration by wild birds, so that it is by this time hard to say whether the park stocks should be regarded as wild or tame. These three species have certainly a better title as wild birds than the city house-pigeons ; and it seems likely that some of the tufted ducks on park waters are wild birds from some of the lakes and reservoirs where they are yearly growing more numerous. Sheets of water are an attraction to most birds on migration, from the food of all kinds usually to be found



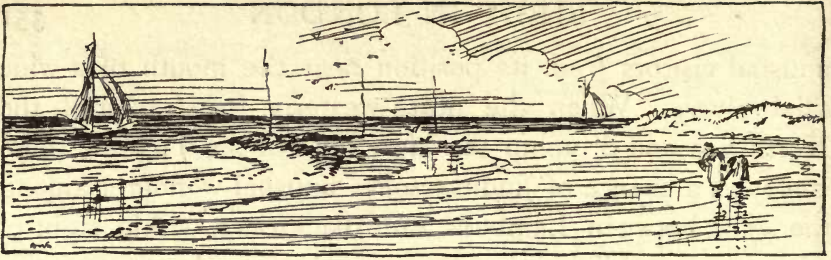
RAZORBILLS

in, beside, and above them. In bitterly cold springs, large parties of swallows and house-martins and sand-martins are sometimes seen circling for flies above the Round Pond and Serpentine, though it is to be feared that they find little to feed on. The same species, and also swifts, hunt now and then in wet and stormy Septembers along the plane-trees on the Chelsea Embankment. But swifts and birds of the swallow tribe are now only visitors, though not rare visitors, to central London. House-martins clung for a long time to nesting-haunts in a few of the airier streets, but have left them for many years. We do not wake in London to hear the screaming swifts betoken a sunny morning, as one does under the purer skies of Paris, though they can sometimes be seen in fine summer weather. But London gains many

unusual visitors from its position near the mouth of a wide tidal river. When the north-westerly gales overflow the North Sea and drive up the high tides in the Thames, there is always a chance of finding some unusual wanderer among the gulls between Lambeth and Blackfriars, within sight of the trains rumbling in to Charing Cross. Last autumn a flock of razorbills were watched by curious Londoners struggling and diving in the tide, equally frightened of the noise of the huge double-decked tramcars on the Embankment and of the dark arch of Blackfriars Bridge, to which the strong ebb was sweeping them. More recently, a dark sea-duck was seen skimming straight and low up the river under Westminster Bridge, and settling on the water in a quiet spot just opposite the House of Lords. As far as could be seen from the gardens further along the river-bank, it was a female scoter. Close by a pair of mallard were quietly paddling and preening themselves in the shallow water at the mouth of one of the old buried rivers, which now flow through culverts into the Thames. Such are some of the unexpected windfalls among the wild birds of London; and they add the perpetual anticipation of novelty to the constant interest of the life of the residents and regular visitors.



A DARK SEA-DUCK . . . FEMALE SCOTER



BY THE SIDE OF THE WATERS ¹

WINTER is much more like winter on the east than the west of England, but only the natives appreciate it. Among the many who loiter in summer among the placid lagoons or on the reed-margined pathways of Broadland, few care to return there when the winds and hailstorms of mid-winter play havoc among acres of dead reeds and rushes. No one but the naturalist and the wild-fowler then find excuse for haunting the Broads, though the season is in most ways the best of all. For the wild-fowl are many. They may be watched bobbing up and down on the troubled waters, until only narrow 'wakes,' kept open by the swans and the punts of the Broadmen, are left between the ice-sheets approaching from either shore. When the waters are coated with the ice, there are mallard and teal and wigeon and many others to be seen restlessly flitting from one Broad to another, to make at length for the salter estuaries and the open sea. In their passing, the flocks pay a too heavy toll to the local sportsman, whose bag will often contain a surprising variety of species.

In these rare winters of severe frosts, when the Broads are locked in ice, there would be silence as profound as that of the pine-woods, except for the ring of many skates. The croak of the moorhen and the click of the coot is no longer heard—the one has gone begging around the precincts of the

¹ Most of the notes on Norfolk are contributed by Mr. A. H. Patterson.

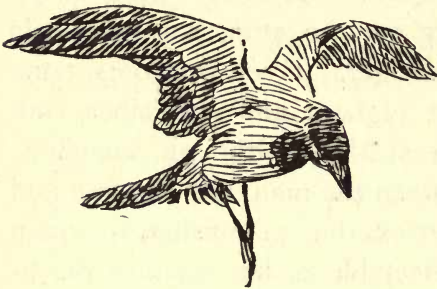
farm premises, and the other betaken itself to the tidal estuary, to feast upon the *zostera*, or sea-wrack, growing luxuriantly upon the mud-flats, sharing it with the wigeon, which so delights in it as to have given it the expressive cognomen of 'wigeon grass.'

Often there are winters that the Broadmen call 'open,' when for the briefest possible periods the Broads are covered by the merest 'slub,' through which the punt goes crackling and rasping her way; while on average days the clouds drop sleet or disperse an uncomfortable and persistent drizzle. On these days the fowl are wilder and more alert: the pochard warily feeds among the towy potamogeton, with sentinels always on the alert against danger. Even the coots, tame enough in summer days, are vigilant and suspicious, and make for the reeds on the least alarm, although, somehow, they seem to discriminate between the man with the gun and the man who angles. The persevering pike-fisher, to whom the wintry Broads are as delectable as his summer roach-swims, inspires them with no disquietude.

A short winter day's pottering in Broadland, to the man who can conquer a disinclination to face a drizzly rain and a spiteful wind, is as full of incident as a spring day at its best. One Broad is as wintry as another, and a curious likeness marks them all. The sea-winds hustle over the sand-cliffs, sweeping along the water whose margins are ill defined by sedges and reeds and marshy stubble: swampy levels and tussocky ronds, like South Sea atolls, push their way into the view: and land and lagoon seem akin.

The low banks of some such river as the Thurne are bare now of iris and pink willow-herb, and sweet-scented sedges: the Broadman has left nothing but the stubble of the 'gladden.' There are many sterner attractions. A stunted willow here and there breaks the level of the banks, and a

laden wherry now and then passes along with its red-capped wherryman shouting a greeting, or offering a comment on the weather. At first perhaps, as you pass up the river, there is little bird-life observable on the waters, an unhappy moorhen croaks discontent from a ditch behind the banks, a hungry gull or two silently pursue the bend of the river, hoping to find something edible in the shape of a small dead bird or the carcass of a tiny drowned mammal. A few meadow pipits cheep mournfully as they take to erratic flight from the herbage, and a flock of grey linnets rise from a patch of



white goosefoot, a plant which grows abundantly on newly thrown marsh soil, and assumes a creeping habit. Odd snow buntings are disturbed from that same favourite weed, which even attracts to the waterside the covert-haunting pheasants.

Lapwings, wailing on the marsh-lands, are fairly numerous, and an occasional bunch of golden plovers is seen. But the merry reed and sedge warblers, so familiar from their confidential manners and pleasant snatches of song to yachting folk in summer days, are absent. The 'visping' of the snipe, the babbling voices of the wild-fowl, and the harsh grating notes of the hooded crows, prowling around, like camp followers, seeking to despoil the dead and wounded, become familiar, and are, perhaps, more in keeping with the rougher spirit of winter. The creaking of the pump-mills and the sighing of the winds through the reed beds make appropriate wintry music. Let any one who wishes to see a characteristic winter scene visit such a place as the 'Sounds,' where dark pools, reflecting the sombre cloud, nestle among

the acres of brown reed, and bulrush stems, where the over-ripe 'pokers' of the reed-mace nod and dance to the rough hustling of the north wind. Floating on these pools, some asleep, some preening their feathers, and others pulling at the sodden vegetation beneath them, are scores of mallard with glossy green heads and their more sober mates. Maybe a shoveller or a bunch of teal come into view, or a diving bird pops up into notice. Now and again you may see the grebe,—the great-crested grebe, more abundant during the summer, and the gossander. Any one living in the neighbourhood, who follows up these waters from day to day, may see—and too often shoots—even less commonplace visitors, some vagrant buzzard or peregrine falcon keenly bent on harrying the wild-fowl; some wing-wearied northern diver, or a rare gull, a Bewick's swan, or a skulking bittern. Rigorously protected by the riparian owners and their gamekeepers from the more vulgar guns of the 'irregular musketeers,' the 'outside' village gunners, most of these unfortunate rarer birds fall to the share of these so-called protectors, and become candidates for niches in collections.

One of these Broadland gamekeepers punting around will discourse of sundry 'rare 'uns' that have visited his beat since wintry weather obtained. There were flocks of wild swan among them, a half dozen little auks driven in, weary, from the sea. A velvet scoter has been hobnobbing with a parcel of 'mussel ducks' (common scoters), and had apparently been diving for small swan-mussels or 'clams' as he calls them; a couple of 'sawyers' (red-breasted mergansers) have successfully evaded him, although a 'sawbill' (goosander) had not been so fortunate; a flock of pintail ducks had joined themselves to the 'duck' (mallard), and he had put up a bunch of golden-eye only that morning as he came 'athort Hicklin' Broad. He had observed a 'game-hawk'

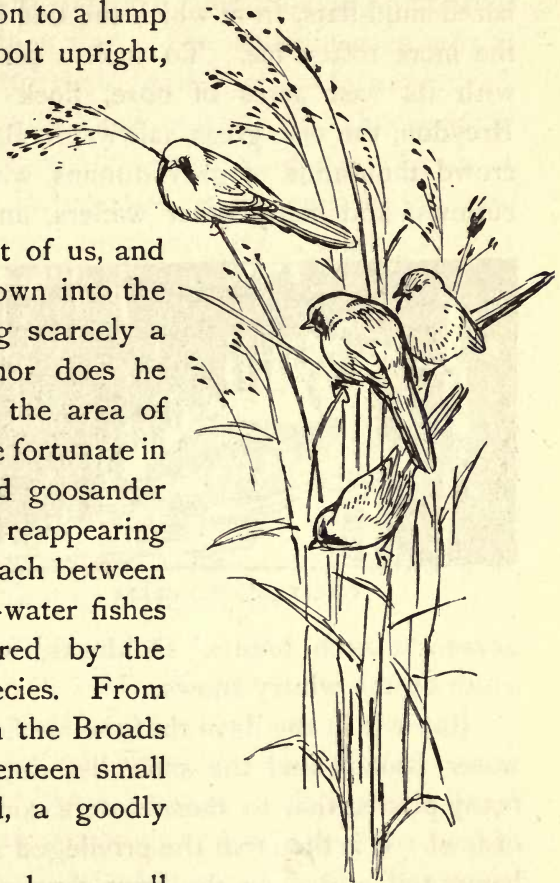
(peregrine) the day before strike down a 'smee' (wigeon), while a small gaggle of white-faced Bernacle geese had been using the 'Sounds' for over a week, 'though there ha'n't bin one kilt as yet, they was so shy,' as if that killing were the final cause of the appearance of the bird.

The Broadland naturalist, like his kindred elsewhere, should be apt at concealing his person and at holding his tongue, for quietude and inconspicuity are essential to bird-watching. These accomplishments, acquired by constant practice, help us to-day: a parcel of bearded tits, most characteristic of Broadland, restless and ever on the move, keeping close to the limited habitat, flit into view, and commence to climb and play the acrobat upon the tall stems of the reed-mace, digging their tweezer-like mandibles sharply into the brown over-ripe velvety tufts, from which downy particles float away on the wind. Unable to find tiny mollusca upon the moister stems below, as in summer days, this bird is happy enough in having at hand a goodly supply of 'pokers' and the seed of the common reed. The bearded tit is as merry now as ever, and frequently utters its clear, metallic 'ping ping,' which can be exactly imitated by balancing a penny on the tip of each forefinger and tapping them smartly together. It is a jolly family party that flits to and fro to-day, regardless of unpleasant weather, and will be merry still when the snowflakes dance in the chill air, and the ravenous pike unhappily dart hither and thither under the clear ice.

Emboldened by quietude, a moorhen or two scuttle along, lightly supported by their long clinging toes, on the matted debris at the base of the reeds, seeking food; and several coots paddle about, diving at intervals and coming up again with a juicy bit of plant root, which, after a preliminary shake of the head, is bolted. Peering from between a tuft of rush

stems, the dark brown head of a crested grebe is observed. The rich brown tippet and earlike crest has long been moulted, and will not be replaced until the mating time. The bird shuffles up on to a lump of matted leaves, sits bolt upright, standing indeed on its flat feet, and begins to rearrange a few ruffled feathers. Then his keen eye catches sight of us, and with a quick header down into the water he goes, leaving scarcely a ripple behind him; nor does he reappear again within the area of our pool. We are more fortunate in watching a dun-headed goosander which repeatedly dives, reappearing perhaps with a small roach between its mandibles. Fresh-water fishes are as readily devoured by the 'sawbill' as marine species. From the crop of one shot in the Broads some years since, seventeen small roach were recovered, a goodly meal indeed.

Now and again a long spell of frosty weather locks up the Broads and rivers beneath a thick coating of ice, when the wherries are unable to leave their moorings for weeks together. Then are the wild creatures sadly put to for their means of subsistence, the tail-flicking moorhens sneak into the neighbourhood of the farmsteads, the coots flock to the tidal estuaries, where the ice breaks above the sinuous creeks



BEARDED TITS

between the mud-flats, and jostles in great jagged slabs on the ebbtide to the sea. Here with various wild-fowl they share the food to be found in the open 'wakes' and on the bared mud-flats, from which the tide has dragged and drifted the more rotten ice. To such a place as Breydon Waters, with its vast acres of ooze, flock various waders. To Breydon, the one great salt-water Broad, in severe weather crowd thousands of grey dunlins, with grey plovers, knots, curlews, and many other waders, and where there is any



GREAT-CRESTED GREBE

open water there drop in 'hard fowl' in flocks — pochards, tufted ducks, scaups, scoters, and often smews and dabchicks, white - fronted

geese, 'Scotch brents,' shelducks, whooper swans, driven south by the wintry snows.

But it is in the days that the ice first 'lays' on the fresh-water Broads, and the snow lies deep on the marshes and fenny places, that to those waters come the greatest crowd of fowl. It is then that the privileged native sportsman takes heavy toll, and even the labouring gunner may earn a meal from their flocks as they pass uneasily from one unfriendly lagoon to another, should they pass over the 'free shooting' corners where it is still his right to sport.

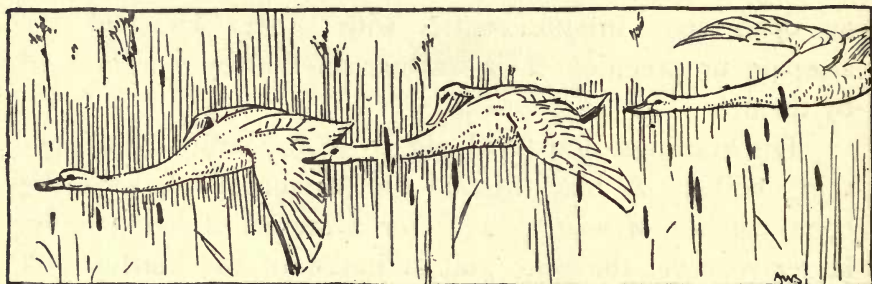
On such a day, when the heavy black squalls, pushed along from the north by the howling wind, dissolve themselves in snow, like wool, and others follow on charged with stinging hail, it is out of the question save for the hardest

native sportsman to get afloat. On such a day a few minutes' view, from one of the little one-arched bridges that cross the small neck of water which often joins one Broad to another, will suffice to gather a good impression of what Broadland on the whole is like. The dense reed clumps at the margin bend beneath their burden of snow, every leaf-bare twig and spray has its touch of white that shoots off in a powdery shower as some hungry bird darts. There is a tinkling sound as the ice crystals on the reed stems chafe in the breeze. One may perchance see a skein of fowl circling round the Broad, or a parcel of them bathing in an open spot in the centre, with others hunched up, sleeping or preening their feathers on the icy margin hard by them.

The starlings, now hard put to it, pry around for anything edible. A black-headed gull disconsolately eyes the open patches of water, eager for a morsel of food; or its larger relative, the grey gull, a junior of the herring gull or the black-backed species, searches for carrion. Dead redwings, starved to a mere bunch of skin and bones, suit them well, or at a pinch any living dunlin or weakened bird they can overtake or seize. The snipe, hard pressed, goes bleating overhead and is off westward in quest of some 'spring beck,' where the snow melts as it falls on moving water, or where, under an overhanging bank, the frost has so far overlooked the still soft larvæ-tenanted ooze. From far overhead come the clanging voices of the bean or the pink-footed goose as they fly in wedge form ahead of the storm; and it is quite likely one may discern a skein or two of wild swans, forced to flit from their northern homes, speeding along with outstretched necks, their white plumage made brilliant by contrast with the leaden storm-clouds behind them.

We may still hear the tinkling of the bearded tits, which find it no great task to shake the snow dust from the reed tufts in order to lay bare for their profit the ripe seed-heads.

At these times bird and beast are put to great shifts for a bare living. Out there by the edge of a pine clump is a gaunt heron watching hard by a water-vole's burrow; if the vole but show itself the bird's stiletto of a bill will pierce its skull as by a lightning stroke. Let the frost 'give' but an hour or two, crows will be seen inspecting the freshly cast mole-heaps showing black above the snow. A batch of



WILD SWANS

a few heavier feathers—the rest have been scattered by the wind—and a red tinge of blood on the snow is all that is left of a little tragedy of the earlier morning. A parcel of hooded crows had found a wounded pochard lying against this grassy tussock. It had escaped the aim of the fowler to fall into the tender mercies of the crows. There may have been two, or even four or five at work; anyway, they did their work quickly and well, for only the breastbone, brought to view by a thrust of the foot against the snow, remains of it. Probably the head and other parts were snatched up by these ghouls to be discussed elsewhere.

One may now often drop across the remains of a big bream, or a jack, or even the relics of a coot, the debris

left by a prowling otter, for flesh as well as fish do not come amiss to him when hard pressed by hunger. Nor are rooks particular when food is scarce. A Norfolk naturalist once came across a score of rooks busily at work on the carcase of a dead sheep, tearing like so many vultures.

The land birds too are hard pressed. The fieldfare finds his hawthorn berries sadly diminishing, the redwings fluff up their feathers to keep their starved little bodies warm, and soon perish in numbers if the snow and frost are slow to go; larks leave the buried wheat-fields and sneak into the market gardens to raid the cabbage patches, and the wood-pigeons skulk for provender where they are by no means desired.



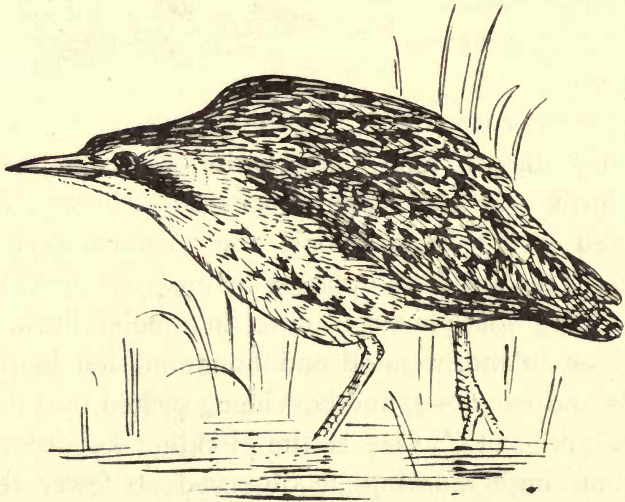
OTTER

A sudden rush of winter may disturb and distress the whole population of seaside birds. From Scottish lochs and Norwegian fiords are driven great hosts along the eastern seaboard of England. On one such occasion as many as seventy Brent geese dashing south were counted in a solid flock. Little auks, driven inland, wearied and hungered, fell helplessly in the pools and meadows, numbers being picked up a little later on dying and dead. One of the Hickling keepers reported that on one single morning he observed no fewer than fifty shelducks, eleven gosanders, two black-throated divers, a red-throated diver, two smews, one being that very rare visitor, an adult male bird, besides golden-eyes, curlews, dunlins, ringed plovers, and sanderlings. A flock of long-

tailed ducks were noted by another observer. The men with guns slew without much mercy or compunction. Three bitterns, a bird that at last has begun to nest again in England, were slain, and many wild-fowl. In the Saturday's market in an east coast town hung from every other stall bunches of lapwings, mallard and duck, smews, starlings, wigeon, and here and there a goose of one sort or another.

With a continuance of the frost and winds the fowl went farther afield, not finding a rest anywhere. Beast and bird and fish longed for the springtime warmth. For the days are hard when

'the snow
Looks cheerless on the fields below ;
And cheerlessly the leafless trees
Toss their dark branches in the breeze.'





FEBRUARY

'And lastly came cold February, sitting
In an old wagon, for he coud not ride,
Drawne of two fishes for the season fitting,
Which through the flood before did softly slyde
And swim away ; yet had he by his side
His plough and harness fit to till the ground,
And tools to prune the trees, before the pride
Of hasting Prime did make them burgein round.
So past the twelve months forth, and their dew places found.'

SPENSER, *Mutabilitie*.

'O quick praevernal power
That signalled punctual through the sleepy mould
The snowdrop's time to flower.

Oh, Baby spring,
That flutterest sudden 'neath the breast of earth
A month before the birth.'

COVENTRY PATMORE, *Saint Valentine's Day*.

THE COUNTRY CALENDAR

FEBRUARY is almost the coldest and the driest month in the year, though it is called Fill-Dyke. Coventry Patmore and Spenser represent the two views. The longer days begin to bring a hundred indications of spring. Especially noticeable, though little noticed, is the flower of the elm and wych-elm, and many other trees. Birds sing and build, leaves bud, a few insects and hibernating animals appear, and sowing begins in farms and in gardens. Marsham recorded the leafing of hornbeam on February 8th.

February 2nd, Candlemas Day, is one of the most important in the calendar. The popular verse for this date runs thus :

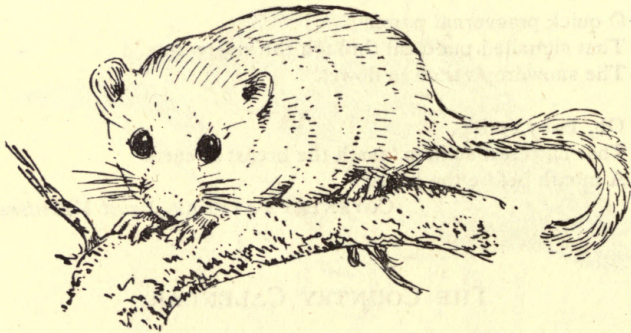
'If Candlemas Day be fair and bright
Winter will have another flight.
But if Candlemas Day be cloud and rain,
Then winter will not come again.'

But the day has a score of maxims attached to it in weather lore. The point of most of them is that if Candlemas be mild we shall suffer for it later on. Rod-fishing begins on some rivers. The close season for birds begins.

February 7th to 10th is put down as one of the regular cold periods, of which there are five others in the year, and it is astonishing how true most of them are to date.

February 14th.—St. Valentine's Day.

Average temperature,	. . . . .	39.5°.
Average rainfall,	. . . . .	1.42 inches.
On February 1st, sun rises	7.43 a.m.	and sets 4.45 p.m.





HAILING FAR SUMMER

IN February wild plants and flowers make a noticeable step towards spring. Half-evergreen weeds which linger through winter, with a few stained blossoms, begin to put forth greener and fresher shoots; and in many sheltered corners of the lanes and woods new stems thrust up through the mould. The earliest flowers of the year are in full bloom in a normal season by the beginning of February, and are quickly followed by a small but conspicuous group. The yellow aconite is the earliest garden blossom, often thrusting through the soil in mild seasons by New Year's Day. It is not a native British plant, but here and there has become fully acclimatised, and has taken its place among wild flowers.

The snowdrop follows it in a fortnight or three weeks' time, and is an even more typical flower of the earliest spring days that are slipped in between the coldest and bleakest spells of winter weather. It is very true of the English climate that 'as the days lengthen, so the frosts strengthen'; and the courage of the snowdrop in flowering under the coldest skies of the year makes it as attractive as its graceful purity. Its snow-white petals tipped with lurking green are a beautifully appropriate symbol of the renaissance of vegetation among the winter's frost and snow; and the whiteness of the snowdrop has more than a merely

superficial appropriateness to the season, but is in harmony with the whole progress of the year's blossoms. The general colour scheme of flowers deepens as the year goes on ; white and pale blue and bright yellow are the prevailing colours in the earlier months, while after midsummer these lighter hues become much scarcer, and are replaced by various shades of purple, and deeper orange yellows. Thus the pure white of the snowdrop's hanging blossom seems the starting-point for the whole floral progress of the year ; and its hidden green is a visible promise of all the verdure to come. The garden snowflake of April and the water snowflake, or Loddon lily, which blooms in May, are both flowers of much the same habit and appearance ; but the snowdrop is far more shy and graceful. The snowflakes are much taller plants, growing to a foot or eighteen inches in height, and therefore needing calmer weather and the protection of taller herbage round them. Snowdrops could only afford to lift their heads so high in the protection of thick brambles and withered herbage ; and in that case they would get little light in the short, dark days when they first thrust from the soil, and their blooming would be long delayed. Sometimes a snowdrop is found flowering as late as the end of March in the midst of dry grass and brambles, through which it has had to thrust its way in order to reach the light. In such an exceptional situation its stem may be eight inches long ; but by the time when it flowers, primroses, anemones, violets, and many other blossoms are blooming abundantly round it, and it is no longer the herald of the year. The two snowflakes are tipped with green on the external sepals, which deprives them of that air of shy promise which is part of the snowdrop's charm. Snowdrops are often found in spots where heaps of moss-grown stones or the slight ridge of a vanished wall indicate the site of an ancient dwelling. This associa-

tion, and their comparative scarcity in woods and thickets, far from inhabited sites, has laid them under suspicion of being early escapes from gardens, like the aconite, and not original natives of England. This is very doubtful, and in any case can never now be proved; while the snowdrop has so long bloomed in complete independence of human cultivation that it is now a genuine wild-flower, whatever may be its ancestry.

Exaggerated importance is often given to the discussion whether well-established plants are native or introduced species; and the arguments for a foreign origin are sometimes pushed unreasonably far. The black or stinking hellebore, or bear's-foot, which blooms in January or early February, is also sometimes said to be an introduced species, chiefly because it is a rather scarce and local plant, which was formerly used in medicine. The same argument would cut out from the British list many other species which no one would seriously deny to be natives. It is also claimed that this hellebore clings to the site of old houses, like the snowdrops; but the statement is less true. Its characteristic haunt is on stony, bushy hillsides, usually of limestone; and it is found in just the same situations of this kind in England, where its native right is questioned, as in Switzerland, which belongs to the central European region where it is admitted to be at home. The truth is that it likes loose limestone hillsides with plenty of protection from rough and nipping winds; and such situations are rare enough to make it scarce and local. It is easy to distinguish from the green hellebore, which flowers about four weeks later, at the end of February or the beginning of March. The black hellebore is a tough, bushy plant about two feet high, bearing dark, tattered, half-evergreen leaves, as well as younger and fresher ones of new winter growth. Its leaves are

palmate, or spreading like the fingers of a hand. The green, rank-smelling flowers grow in a cluster at the top of one or more stems. The green hellebore also grows in woods, but



BLACK HELLEBORE

in less stony situations. It is a smaller and slighter plant, about nine inches high, and without the dark and tattered half-evergreen growth of the other species. It bears a smaller cluster of larger blossoms, which are of almost the same tinge of green as the fresh leaves, whereas those of the

black hellebore are pale, and look paler by contrast with the dark leaves of the old season's growth. The black hellebore is a curious and interesting plant, but hardly beautiful; but the green hellebore has real grace, when it thrusts abundantly from the carpet of dry brown leaves in a chalky



GREEN HELLEBORE

beech-wood. These plants are close relatives of the garden Christmas rose.

Another early-blooming plant, often found on the same soils as the hellebores, is the spurge laurel. It is a sparse, woody plant, growing from one to four feet high, with ever-green leaves much like those of the Portugal laurel, but narrower. It is a close relative of the rare and beautiful

mezereon, which blooms on almost leafless shoots in cottage gardens in early spring. But it bears green flowers instead of pink, and is chiefly attractive for its lustrous leaves and the interest of its curious blossoms. All green blossoms have a kind of fascination, since green is the familiar colour of stems and leaves, but not of flowers; and the spurge laurel's blossoms are remarkable for their abundant secretion of nectar, which gives them a semi-transparent appearance, and is very attractive to many kinds of flies. Flies are also attracted by the blossoms of the hellebores. Spurge laurel can sometimes be found in bud as early as December; it is usually in blossom by the latter part of February, and continues blooming into March.

Most of the young green shoots in the February woods are those of another green-flowered plant—the dog's mercury. This is the abundant and vivid plant, a few inches high, with pointed leaves and strings of green blossom, which is seen almost everywhere on earthy hedge-banks and about the edges of copses and woods. It is one of the most precocious spring plants, and pushes its way up in sheltered places from Christmas onwards, spreading in February a vivid mantle under the hazel and hawthorn stems. It will not grow in the darkest recesses of the woods and gorges, and prefers a fairly rich loamy soil, disliking sands; but, given these conditions, it seems entirely independent of sunshine, and flourishes on moisture and west wind. The longer strings of blossom are borne by the male plants. The flowers also attract and are fertilised by flies. The dog's mercury blooms plentifully by the end of a mild February, and reaches its fullest growth in March and early April. Far on in May, when it is out-topped by newer herbage, and its February vividness is tarnished, the female plant bears round rough seeds under the heavy shadows of

the wood. The lesser celandine is another plant which blooms on the threshold of spring under boughs which May will darken. In the warm south-western counties the children's buttercup is sometimes to be found flowering even in January ; and in February it shows itself in most places



PRIMROSE, BLUEBELL LEAVES, LESSER CELANDINE, AND DOG'S MERCURY .

on warm banks and in sheltered meadows. Its habit of blossoming on ground overshadowed by later vegetation is seen most strikingly where it grows under the spreading boughs of a lime or sycamore, or other spreading deciduous tree in a cattle-pasture. All through the summer the dense foliage keeps the grass scanty beneath it ; and the cattle sheltering in the dog-days trample the last blades away. When early spring comes round, the tree-trunks are sur-

rounded by a wide circle of bare earth on which the sunshine falls almost unhindered by the leafless boughs. On this open bed the celandines cluster thickly, flattening their marbled leaves on the bare soil, and lifting their rayed faces to the sun. Late February and early March are their hey-day; as the foliage expands and the shadow deepens, they fade; and by the silent days of August the circle is worn bare again, and all has perished except their buried tubers.

The colour of primroses is midway between the green of dog's mercury or hellebore blossoms and that of the true yellow flowers, such as buttercups or dandelions. Green is the most restful of all colours to the eye; and part of the peculiar attraction of primrose blossoms is probably due to this admixture of green. How far this colour is from a true yellow can be seen when we view from a little distance a bank sprinkled with primroses and dandelions. By the side of the golden dandelions the primroses are pale against the background of grass. The contrast of the primrose with its near relative the cowslip is scarcely less marked, and is often displayed in the same way under a hedge-bank or at the border of a field. Primroses are extremely persistent in growth; in sheltered situations and a mild climate they often begin to form succulent leaves and flower-buds in early autumn, and bloom in any month from September onwards. Their flower-time corresponds less closely to that of most spring flowers than to the song-time of such birds as the song-thrush and robin. They begin their songs after the drowsy season of late summer, and continue it in mild weather all through winter, increasing in vigour as spring approaches. Substituting growth for song, this is precisely the way of the primrose. But snowdrops do not appear above ground until a short time before they bloom; and several other flowers which can be found in the winter days are

straggling survivals of the past summer. Red and white dead nettles still bloom on strips of waste ground and by the ditches; creeping speedwell opens its blue eyes on heaps of earth and rubbish and undisturbed garden-beds where chickweed keeps a few dull white blossoms stained by frost and rain. Dandelions put out tarnished and half-closed blossoms from among the old coarse leaves, which die away to give place to the tender blades of spring. The common gorse and the daisy flower in winter in a more occasional and spasmodic way than the primrose, but with a fresher and more vigorous growth than the bygone summer's weeds. By the end of November the orange-yellow blossom of the dwarf autumn gorse has faded; but from that time onwards sprays of the taller common gorse can be found in bloom here and there, until the approach of spring gradually sets it blossoming far and wide. It does not reach the height of its flower-time until May. Daisies bloom on in much the same irregular way, until April sprinkles them everywhere.

It does not need actual blossom to give a sense of life and promise to the hedges and woods in February. In every mild corner spears and tufts of verdure are thrusting and unfolding to the west wind's caressing touch; they are vivid with the luxuriance of spring. Furled arum leaves wax and widen daily above the leaf-mould in the hedge-bottoms and on the floor of the copses; they and the spikes formed by the young bluebell leaves before they fall apart have the firmest and most lustrous texture of all the green things swelling towards spring. Pushing bluebell spikes will pierce a dry oak or beech leaf which obstructs them, and rise with it girdling their middle; sometimes they poke their head into a nut gnawed by a dormouse or squirrel, and lift it several inches into the air. It is fascinating to

study a hedge-bank full of those thrusting points and to observe their various experiences in making their way into the world. The strength with which they will thrust up a dry clod is surprising. After they are fairly through the ground, and have done their work of penetration, the spikes fall apart into their component leaves, among which the flower-stem will rise later. By the hollow sides of flowing



BLUEBELL PUSHING THROUGH
A WITHERED LEAF

ditches the marsh marigold lifts its firm but miniature leaves and buds, which will gradually swell till the time of flowering is come. Cow-parsley multiplies in the drier ditches its heads of fine-cut foliage, as luxuriant as the more solid shoots of the marigold and arum. The rings of little blue-green leaves which have hung since Christmas on the ropelike honeysuckle stems grow very gradually larger as the weeks of February draw on; and the sparse rods of the elder begin to show promise of their summer luxuriance as the dark buds give birth to bright leaf-

tufts. A new spring lustre comes to the grass on the warm banks and in the sheltered corners of the fields; the beauty of mere grass is often ignored, yet no plant is more delicate and lustrous, or more characteristic of Nature in England. The front of the hedge is hung with hazel-catkins brightening as the days go by, and growing mealier and brighter as the scales open and show the pollen stored beneath them. Far back in August and early September the catkins of the coming year were beginning to swell in the shadow of the still untarnished leaves. By Christmas in mild corners of the lanes they

were already lengthening into the 'lambs' tails' that attract children's eyes; but they do not grow ripe with pollen-dust until some time in February. The hour when they need their pollen is when the minute but vivid crimson blossom thrusts out from the end of the leaf buds to receive it, shaken by the wind; and the female blossom of the hazel does not usually appear until March, though it can be found in February in very early seasons. The pollen of the catkins is ready a little beforehand, and in many places is ripe before the end of February for the March winds to sow broadcast among the twigs set with fertile stars.





PAIRING AND EARLY SONG

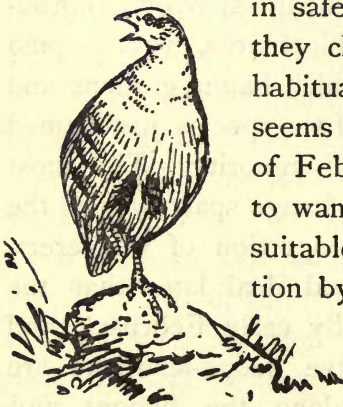
EARLY in February there is a rapid increase in the number of birds in song; and at the same time they begin to pair and settle down in their nesting-quarters. The traditional date for the pairing of birds is St. Valentine's Day; and this is as accurate as any one day that could be named for a process which extends over many weeks, and is largely influenced by the openness or severity of the season. By February 13 in a normal year separate pairs of birds begin to be conspicuous in lanes and sheltered gardens and in the open fields; and this new feature in their distribution gives a promise that the nesting season is at hand, though for six weeks longer the wandering winter flocks of many species are to be seen side by side with the newly mated couples. Not all birds choose fresh mates every spring. Many of the larger species, such as the birds of prey and the crow tribe, apparently mate for life; and for them the pairing season merely means closer companionship and a more constant attachment to their nesting-place, which in many cases is also a permanent one. It is likely, though it is still unproved, that mating for life is the general rule among small birds also, though there are probably many exceptions. Cock and hen birds of migratory species may meet again in their

accustomed spring haunts, and resume the partnership which their winter wanderings have interrupted. So far as the adult birds are concerned, the winter flocks may be an aggregate of pairs rather than of individuals: and many pairs may keep together through all their wanderings, and be ready to settle down either in the old haunt or in some new one when the weather begins to grow springlike. Chaffinches separate in autumn into flocks composed almost exclusively either of cocks or hens; and in their case the chance of the same pair meeting again might seem small. Yet even in their case there would be little difficulty about it, if each bird returned to its last year's home; and the records of marked birds of other species show that this happens sufficiently often to make it probable as a general rule.

The first birds to settle down in couples are naturally those which have been most stationary during the winter. Conspicuous among these are the hedge-sparrows, house-sparrows, robins, song-thrushes, blackbirds, wrens, pied wagtails, and a few other species which haunt gardens and other sheltered spots. With most of the species just named the resident birds are only a small minority. The most stationary species are the house and hedge sparrows and the wren; but even they indulge a proportion of wanderers, which pair and settle down a good deal later than the regular dwellers in our gardens. By early February, and often earlier, the usually unobtrusive hedge-sparrows are beginning to chase each other along the hedges and through the shrubberies with shrill pipings, and to show watchful interest in the particular corner where they intend to nest. Blackbirds drift apart into special clumps in the shrubberies; and timid hen thrushes are seen in the shelter of the bushes where the cocks sing more and more loudly

from the boughs. The wren's mate follows him as he slips, mouselike, through the chinks in the faggot-pile or along the eaves of the old thatched shed; and the impetuous scrimmaging of the cock sparrows increases as their black throat-patch becomes more clear. Neither the song nor the fighting of the cock birds of various species has probably so definite a purpose of winning a new mate as is often supposed. Both their song and their combativeness are natural ebullitions of a spirit fired by spring; they sing from increased vitality, and fight more or less promiscuously from the same incentive. Young birds still unmated may gain their brides by force of arms or vigour as expressed in song; but the old birds sing as vigorously as the young, and if they fight, it is less often to win a mate than to warn off an unmated intruder.

Carrion crows are winged Ishmaelites which have often to travel far before they can find a spot where they can nest in safety; and when we see how closely they cling together on their wanderings, habitual constancy among migratory birds seems more probable. Before the end of February pairs of carrion crows begin to wander about the country in search of suitable nesting-places, and attract attention by their loud caws—more hoarse and snarling than those of the rook—and by their way of posting themselves conspicuously on some lofty perch. They settle early in the

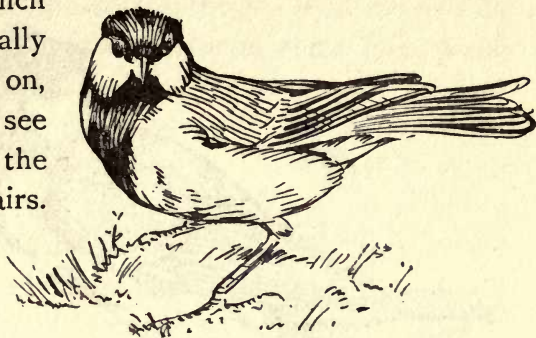


COCK PARTRIDGE CALLING

place where they intend to nest, but do not naturally begin to build until the end of March or early in April. If they are left in peace, they will often nest in the same wood or clump of trees for many years in succession; and then they are less

conspicuous in February and March, since they are not forced to hunt for a new home. Pairing is equally conspicuous in February with the partridges, which are among the most sedentary of our birds. Instead of the packs or shrunken coveys in which partridges are generally

seen as the winter goes on, early in February we see them start up from the grass and stubble in pairs. The time of the first pairs varies not only according to the weather of the season but to some extent with the

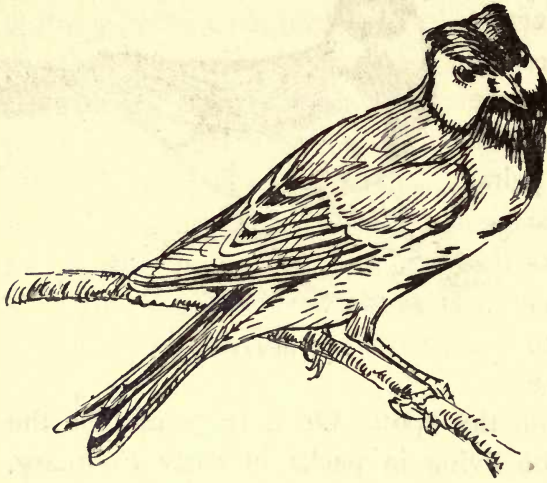


GREAT TIT

height and climate of the spot. On a ridge of hills the partridges may still be living in packs in early February, when they are paired in the fields lying below. From the wheatfields in the lengthening evening twilight comes the call of the cock partridge mounted upon a clod; and this note of spring mingles pleasantly with the song-thrush's music, and the spring cry of the great tit in the apple-trees.

This 'saw-sharpening' cry of the great tit is one of the most typical spring notes, and one of the most distinctive of the many different notes of the titmouse tribe. It is a shrill, rasping double note, repeated with see-saw persistence more and more regularly as spring draws near. It is not seldom heard in January, but begins to be common as pairing-time in February comes on. Bright sunny mornings will draw forth the spring cry of the great tit, as of many other birds, even after frosty nights; but it is likeliest to be heard in calm mild weather. The great tit calls so boldly that it is not difficult to trace the crude song to the singer, which is easily

recognisable with its black crown, dark stripe down a vivid yellow-green breast, and the conspicuous white cheek-patches which have given it its name of oxeye, much as the large moon-daisy is called the oxeye daisy. A little later



GREAT TIT

than the great tit, the blue tit also begins its spring song. This is more musical than other notes uttered by this tribe of birds; tits' notes have generally a twanging or metallic ring which makes them easily attributable to one species of the tribe, though their variety makes

it often hard to identify them more particularly without careful observation. The blue tit's spring song consists of two or three plaintive calls followed by a tinkling peal—much like a small silver bell sharply pulled and echoing out its peal. This song is constantly uttered by the cock bird as it hunts among the twigs in acrobatic attitudes, often with its mate in attendance.

Missel-thrushes are sometimes heard singing as early as December; but their free song is usually first heard from some lofty bough on a morning or evening in February, when there is a noticeable increase in the light as compared with the short dark days. It is more like the blackbird's and ring-ousel's song than that of the song-thrush; and it is often mistaken for the blackbird's when heard early in the

year. It consists of a phrase of three sweet notes, deeper and richer than the song-thrush's, and repeated with little variation often for a great length of time. On a February or March morning, with a bright light and a strong wind that bends the boughs, the missel-thrush will often sing almost uninterruptedly hour after hour on some lofty perch in a poplar or elm. It makes little difference to the bird's spirit and enjoyment if a driving north-west wind brings showers of cold rain or hail. The bird's apparent delight in boisterous weather has given it the common country name of storm-cock. Blackbirds dislike such riotous weather; if they are heard in February, it is generally on some morning of premature sunshine, when the crocuses in the south borders are yawning their utmost to the bees, or at sunset on some unusually mild evening. Often they are not heard until March. With a little practice it is not hard to distinguish the two birds' songs. The missel-thrush's is much more limited and monotonous; and sweet as it is, it has not the richness of the full notes that the blackbird seems to turn over in its throat. Shyer and wilder than either the song-thrush or the blackbird, its sweet but unskilled music seems truly to fit its nature; and the tireless song streaming from aloft on some turbulent February morning is one of the most satisfying of all sounds which tell of the oncoming of spring. As missel-thrushes pair and search for nesting-places, they very often draw closer to gardens and houses than is their habit at other times of the year. This seems to be due to their fear of carrion crows, which are inveterate



MISSEL-THRUSH

stealers of eggs, and must often find an easy prey in the missel-thrush's conspicuous nest when it is built in open hedgerows and copses. Crows usually avoid the close neighbourhood of houses, where they expect to find enemies with guns; and the missel-thrush's shyness of mankind is overcome by its mistrust of the crow. It is probably owing to the same reason that rookeries are so often built close to man's dwellings. Crows are great robbers of rooks' nests, though rooks are their own close kin. As rookeries are usually in warm and sheltered places, rooks are some of the earliest birds to pair and nest. Ravens also nest from year to year in the same site, and are as early breeders as the earliest rooks, though they haunt wilder and bleaker regions. But crows do not build until late March or early April; and this seems to be due at least in part to their being usually prevented from settling permanently in one spot, and compelled to discover a retreat where there seems a chance of being undisturbed.

Another step forward in the year's progress towards spring is marked by the first singing of the chaffinch. So large a part of the whole volume of song in England is supplied by this most plentiful and animated bird that the chorus before its singing-time is necessarily thin. Before the middle of February the gay and vivacious ditty begins to ripple from the orchard fruit-trees or the hedgerow elms; sometimes, when an exceptionally bright and warm morning follows a long spell of gloom and cold, the song of the chaffinches seems to break out in a positive torrent. But the song is not always complete at once. It consists of a run of rapid notes ending in a kind of flourish or twirl; and when the chaffinch first begins to sing, he cannot always accomplish it perfectly. The notes become slurred and confused, and the bird stops in the middle, tripping over its

own music; and sometimes it seems to break off from sheer insufficiency of vitality to attempt the difficult final passage. It is very interesting to listen to two or three cock chaffinches singing within earshot of one another on a warm February morning, and gradually improving in delivery under the stimulus of practice in competition. One bird is generally more perfect than the others; he may sing the song perfectly nearly every time, while the others do it seldom. The instinct of rivalry keeps them sedulously to their song; and as the day advances they are often noticeably more perfect than a few hours before. A day or two later, they execute their roulade so spiritedly and smoothly that one might think they could never have felt any difficulty about it. Yet it is impossible not to recognise that they have a force of inertia and unfamiliarity to overcome at the beginning, though the spirit which impels them may be an almost completely unconscious instinct of vitality, and no such deliberate and critical purpose as directs a human singer. Chaffinches' songs vary a good deal; one bird's song differs from another's, and the general type of song seems to be different in different districts. But its general character is the same always; there is the rapid preliminary run and the final ascending flourish, which makes the difficulty for the bird when it first begins to sing.

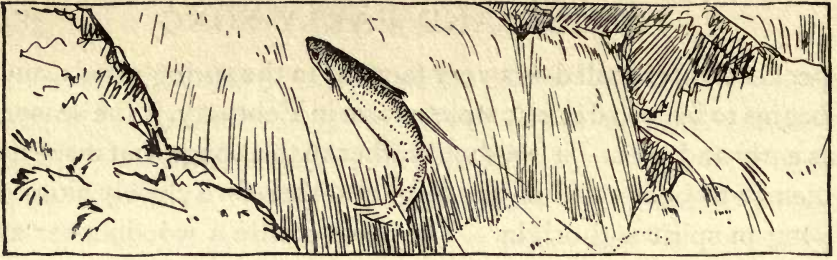
Only a song with a definite and rather elaborate pattern allows us clearly to mark the stages by which the bird reaches its full spring skill. The yellowhammer sings a song of much the same kind, and begins it at about the same date. It is a plaintive song, as the chaffinch's is emphatically a gay one; instead of a rising flourish, it ends with two lower notes. But there is the change from the opening notes in each case, and the consequent difficulty for the bird when it begins to sing in February. The yellowhammer's song can be well

memorised by the country version of it—'A very, very little bit of bread and no cheese.' The last two words represent the two lower notes at the end; and these at first the bird is often unable to deliver. The February sunshine falls on the golden bloom in the hillside furze-brake, and on the golden feathers of the birds perched above; and they answer one another with the halting and incomplete notes soon to develop into the ditty that echoes so persistently by the sun-smitten highways late into August and September. Perhaps one yellowhammer gets the full song about once in three times, another delivers the first and most emphatic of the two final notes, and a third does not get more than half-way. Before they begin to utter even the easier early notes of their song, yellowhammers display the rudiments of the impulse to sing in a curious and noticeable way. About sunset at the beginning of February they mount to the same conspicuous perches in the hedges and gorse-brakes where they afterwards sing, and utter a laboured chirp with an air of emphasis and challenge. It is an exceedingly rudimentary method of expression; but the bird's whole demeanour indicates strongly that it is meant as an effort at song, and as a vindication of its right to that particular stretch of the hedgerow or thicket. This stage does not last long; ten days or a fortnight after the yellowhammer has begun to act in this way it usually begins to sing, and in a week or a fortnight more the well-known ditty is complete.

There is little or no similarity of tone between the yellowhammer's rudimentary chirp and the notes of its song; nor has the chaffinch's song any noticeable likeness to its common cries and call-notes. But the development of the green woodpecker's full notes as spring approaches is an interesting example of expansion from the normal winter cry. The loud laughing note of the 'yaffle' or 'eclé'—as the green wood-

pecker is often called—is very familiar in the spring woods, and begins to be heard in a complete form in February, if the season is early and open. It is a shout rather than a song; but it seems clearly to be a shout of gladness, and therefore closely akin to song in spirit and origin. Yet if we startle a woodpecker as it feeds on the ground under the winter hedgerows, it often utters a cry which is merely its spring laugh cut down to two or three notes, as it shoots up and undulates across the field.

Snipe begin to drum in mild seasons in the south of England in the second or third week in February, when they pair and settle down in the marshy fields where they nest early in April. Their drumming or bleating note sounds extremely like the baa of a young lamb, and is even closer to the bleat of a kid. It is the snipe's equivalent for song, though it is not produced vocally, but by the vibration of the web of the two outer feathers of the tail. This is peculiarly stiff, and produces the bleating note whenever the snipe drops slanting downwards in the course of its long flights over the nesting-ground. It winds swiftly about the sky within a space of about a quarter of a mile, and every few moments drops obliquely downwards, when the bleating note is almost immediately heard. It ceases as soon as the bird reaches the bottom of its descent, and again shoots up. The sound has been reproduced by binding the snipe's outer tail-feathers to the shaft of an arrow, and shooting it into the air; the sound began when it descended. It is remarkable that while some American and African species of snipe drum in the same way as the common snipe, great or double snipe do not drum, but display before the hens much like the blackcock. The jack snipe has yet another method of nuptial expression. It makes in the air a sound described as being like the galloping of a horse over a hard road; and it is thought that this is vocal, though the point is still undetermined.



THE SALMON'S JOURNEY

A RESTLESSNESS following the longer hours of light, and that tide in the flow of life which is beyond explanation, begins to overtake one set of creatures prematurely. In February most hibernating things stir from their winter's sleep: and the farmer grows eager to 'get on the land.' The world is full of stir. The wheatear and chiffchaffs have begun their oversea journeys, and our native birds are building. The buds on chestnuts, cherries, quicks, and hornbeams show greenness. A hundred instances may be noted during the month, and but very few a month earlier.

The salmon is an exception. He is pioneer. In the waters winter is spring, and in them no animal is more invincibly determined to share in the free play of life than the salmon, and as his life history is now at last being traced out, the knowledge of his energetic vitality grows. A score of small problems remain to be solved. We are not sure how far afield the salmon journeys when he leaves the river. We are not sure how often a salmon may spawn in its life. We do not know how complete is the clearance from the river, or whether the spent fish follow a regular impulse like the rest. But we have no more abundant evidence about any creature than the spring return of the salmon from sea to river. Over the whole domain of natural history is no more vivid evidence of the force of the migrating impulse,

the passion of movement from one home to another. Nor in any other animal can you see more distinctly the joy and zest with which the return is associated. If one may use such words, the movement is passionate and exultant. Perhaps no one who has repeatedly watched salmon entering a river will quarrel with such words.

There is a salmon river on the west coast of Ireland which is peculiarly 'early,' and rivers differ much more than land in the qualities which both fishermen and farmers call early and late. The waters which are neither very broad



A SALMON RIVER

nor deep tumble into the sea over a great stretch of loose shingle where they lose their depth, even in spate and at high tide. If you watch well this space between river and shore on a favourable day in a favourable season you may see, even as early as January, the pioneers of the salmon migrants rolling and scrambling and scraping their scales over the shingle. They looked as if they exulted in the struggle, as if it were a sort of obstacle race for a great prize. When the migration is at its height you may see scores of fish, appearing and disappearing from the shallow water, some seeming to be stranded, but all making with astonishing impetus over the obstacles to the goal of the river or lake behind the river. Poachers have before now trained dogs to

catch the fish as they come over the shallows. Often the fish are so obvious that it is difficult to prevent a retriever from dashing in and pulling them out. It is usual in scores of rivers to net the fish as they enter the mouth. The river is contracted into narrow channels, and by a few simple mechanical contrivances every fish that rushes up can be easily netted. The very best and keenest sportsmen, whose favourite among all sports is salmon fishing with a fly, share in this netting, which may be very lucrative, especially on the early rivers. It may be imagined that it would not require the capture of many 20 lb. fish to pay a dividend when the price is 5s. a pound. The fishing in many districts has to be watched with extraordinary closeness, as these Irish poachers will get the better even of a man posted at the very spot, and armed with a gun or pistol. The fishing on some rivers has been ruined because there has been regular poaching at the mouth on the morning and night of Sunday, which is recognised as the closed day for fish as for game-birds in England.

Other countries differ in this respect. In Belgium there is enacted the curious law that certain kinds of fish may only be caught on Sunday. The law was passed of course in the interests of democracy. Fishing is a national amusement. Every river in the country is in the common phrase 'trop battue,' or 'threshed to death,' but the populace can only find leisure on Sundays for their favourite amusement, and on their behalf the right to take out from the rivers some of the coarser fish is strictly confined to Sunday. Preservation is most successfully maintained by the system of sanctuaries. It is forbidden to fish *entre les bois*. Wherever the woods come down to the streams, that stretch is government property, and if any unwitting visitor wanders on to the forbidden ground, some woodsman, caparisoned like a

follower of Robin Hood, will descend from the covert and explain the law with firm courtesy. His courtesy would be more hardly strained if he were acting on such government instructions along the rivers of Sligo or Clare, or even in Scotland. But in Scotland the halcyon days of the poacher are over, and it would be difficult to find a to-day's parallel to the great scene between Mr. Geddes, that warlike man of peace, and the banded poachers in *Redgauntlet*. It would be less difficult in Ireland to find modern instances of the sort. The daring and the endurance of the West of Ireland man is almost inconceivable. He will on occasion swim down the river in the coldest winter night to adjust the net aright and enclose a likely fish. Many indeed kill themselves from recurrent exposure.

All salmon, it is now proved or almost proved, have a true instinct for their own river, and thanks to it the early rivers are not more crowded with fish than the late. It is astonishing how greatly rivers in the same locality vary. One of the earliest of all the rivers empties into the sea at Sligo. The fresh-run fish will begin to run up in December. In the Erne, a few miles more north, the salmon come with the other events of the spring, with the cuckoo, and swallow, and bluebells. And the rivers differ in different years—there are early years and late years. The reasons are more simple and obvious than we can usually find to account for migration. Where the falls are heavy and steep as in the Erne the water must be of just such a volume as the ascent requires. One of the most glorious and surprising of natural spectacles is a salmon jumping up a fall. The heavy narrow channel at the point where the salmon are netted often looks over-powerful for even a fish, and many of the falls look impossible. But the salmon will curl itself into the likeness of a steel spring and give way with equal force. He rushes

the obstacle, he storms the wall with a commanding impetus, with dash of the utmost desire, using with incredible agility the fulcrum both of rock and water. The ascending salmon also requires water of a certain temperature. If the snows have melted in the hills and are coming down in curdled rigour the salmon wait in the sea till the utter chill is gone. They wait if the wind is driving Atlantic combers against the mouth of the river, and they wait also, as the best prophets find, from instinctive senses of fitness which no man can penetrate. The leaping of the falls and so-called salmon-ladders, set to make feasible the more difficult and impassable falls, is one of the supreme sights; but for sheer joyfulness it is perhaps surpassed by the preliminary leap or two taken in the first pool when the difficulties are surmounted. It is often the introduction to a straight and clean run from the mouth to the lake or upper reaches, the salmon's version of 'altiora peto.' Fishermen on the lower reaches may have the pleasure of the sight long before they have the pleasure of feeling the fish on the line. Quaint devices are tried, sometimes with conspicuous success, to prevent this race. Over the fish's sense of hearing and colour sense a great controversy rages, but there is no doubt about the salmon's nose and sight. Something may be done to stop the mad race up the river by swinging in the river any considerable object of an unusual sort; but there is nothing so effective as a piece of rotting fish swaying in midstream. It gives the salmon pause, and that pause, which may be prolonged, is the fisherman's opportunity.

How many sportsmen say that there is no pleasure in sport comparable with the landing of the first clean-run fish of the year. There are men so eager that they will thrash the water for many hours of many days before any sign of a salmon has been seen. It is odds that in this while they will

have pulled out one or two spent fish, lean and lank, and in a sense unshapely and ugly. It seems likely that the fish which have exhausted themselves in spawning lose the native instinct with the interest in life. They may seek the sea, to be renovated with silver scales and perhaps again after a while to attain a perfection, fitting them for maternity, or they may stay half alive in the river with their bright cleanliness and firm outlines departed. Even the man who has never thrown a line can imagine the extreme delight of the fisher who has endured days of vain casting in January when 'winds and ways are foul,' who has felt the full excitement of striking a big fish, only to land that unfishlike thing, a spent salmon, and who at last sees the silver gleam and feels the kick of a good fresh-run fish regenerated in the sea, and to know it to be the forerunner of many another. From Sligo to Scandinavia there is no sporting event to rival this.

The salmon is the king of fish, and his ways are more noble than those of his subjects in river or sea. Very few fish come much under regular observation apart from their readiness or reluctance to take the fly or swallow the bait. But no one, however little a fisherman, should fail, if the chance offers, to watch trout at spawning-time. Autumn is their spring. They spawn in the autumn months and at the time when the ewes of the Dorset Horn sheep have their young. The persistent, careful and unchanged action of the fish in preparing the bed for the spawn seems to bring them into the common scheme of things. They become not so much unlike the moths who lay their eggs in the bark or the birds that make soft places for their eggs. One might compare them with the wild duck or the rabbit. They do not tear out their scales to make a nest; but they are ready, even eager, to lacerate themselves to provide a fit place for the eggs. It is a very wonderful example of the maternal

instinct, this burrowing of the mother fish. On any favourable gravel patch in a trout stream you may easily watch the fish—it may be, first, fighting for the right of possession—scrape and wriggle and butt against the gravel with half-frenzied energy, until a hollow is scooped of just the due depth, where the waters shall keep fresh the eggs but not remove them, and all the requisites of incubation be perfectly served. The uniformity of the mother's choice of a cradle and her energy in preparation contrast strangely with the incalculable mortality. If ever there is reckless expenditure it is in the ova of a fish. The Tennyson line 'of myriads brings not one to birth' might attach as truly to the fish as the sallow. All that one can say, here, as in the fields, is that in the scheme of things expenditure is not waste. The eggs and the young fish, to repeat a comparison, are as the wheat of the fields. They are produced not only to the welfare of their own race.

But the tribes of fish that spend much time in the sea, and like the salmon make periodically for inland waters, are much larger and more various than is usually understood. Millions of various species make their way to fresher waters in order to carry out the universal instinct of multiplying their kind. When this is accomplished they leisurely find their way back to the sea. Among them are the smelt, the lamprey or lampern, sea trout, grey mullet, and many others. Some come up in such numbers as to make their capture profitable. A number of men in East Anglia devote their time during these periodic migrations to nothing else but their capture. The smelt is a notable instance. Others come upstream in so unobtrusive or so irregular a manner as to be seldom sought after, although on occasion their numbers may be so great as to astonish their captor. Some years ago a man who had set an eel-net in the Waveney, after one night's

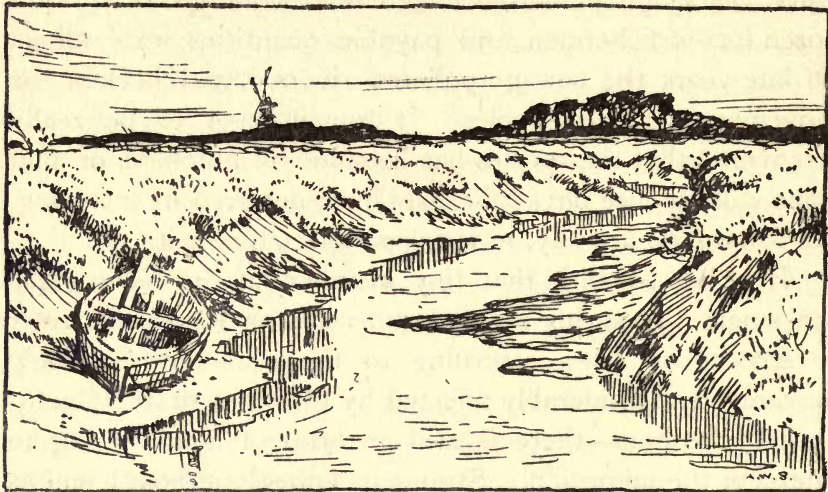
fishing was astonished to find, beside a certain quantity of eels, no less than 5 cwt. of sea lampreys. On another occasion an eel-catcher made a haul of a ton of river lampreys.

The plump, wary grey mullet, that very rarely takes a hook in the East Anglian waters, used at one time to crowd in shoals to the Norfolk Broads, but now seldom comes in. Fifty years ago mullet-nets were in the hands of quite a dozen lots of fishermen, and payable quantities were taken. Of late years the sewage-polluted rivers have checked the movements of this species. It remains yet to be really discovered that the species has lessened in numbers, or that some still obscure physical causes have deterred its incoming. No fisherman, anyway, now fishes especially for it.

It is not so with that tiny member of the *Salmonidæ*, the smelt. In spring and autumn when on its way up river to spawn, or when returning to the sea—both leisurely movements, considerably affected by the want or the abundance of freshets—there is still an army of men waiting to intercept the migration. Strangely enough, although smelts will travel to Norwich to spawn, a distance of over twenty miles, very rarely has one been taken on the Broads, at an equal distance, notwithstanding the fact that large catches are made several miles up the river Bure.

Flounders abound on the east coast, both on the Broads and some way up the rivers. They enjoy brackish waters, and even resort to reaches where the salt waters reach them on the flood and the fresher waters on the ebb. The herons from a neighbouring heronry capture bushels of small ones. The larger flounders live well: the common sand-shrimp is pursued with avidity, and on a still night one can hear the flapping of these flat fishes in the shallow creeks as they dash after the crustaceans or over the mud-flats. With these

congregate myriads of three-spined sticklebacks, themselves drawn down by the surplus waters drained through the sluices into the river. To the sea perpetually drift these most vigorous of fishes; and when the draw-netters sweep in their captures of longshore herrings, codlings, smelts and other marine species outside the harbour, these come ashore kicking merrily and yet viciously, for they are as much at

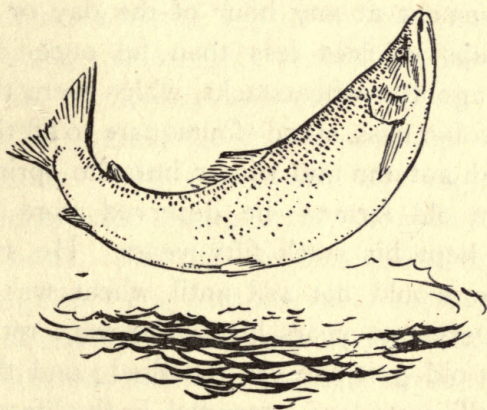


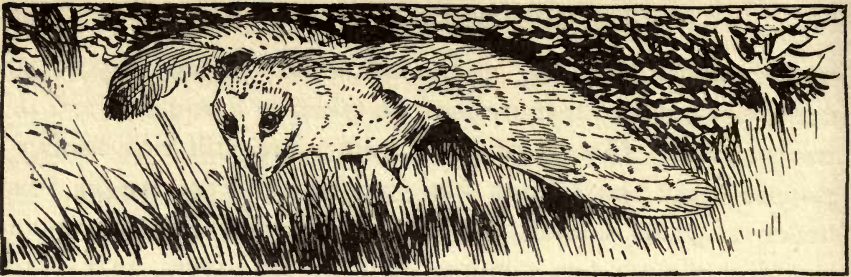
'FLOUNDERS AROUND ON THE EAST COAST'

home in salt as in fresh waters. When winter locks the shallow ditches it is more than probable the stickleback pokes himself into the ooze, and even when it is more or less hard frozen remains alive.

In colder weather many eels disappear into the soft ooze. Some are of immense size, and sometimes you may come upon a 'bed' of them. But the greater mystery of the eel is its migration. They usually move in September to the sea, often in very compact bodies, and strangely little is known of their subsequent movements. But they are only less gregarious at this season than when they hibernate through

winter and early spring in the soft mud. Here they lie so close that a stone or more may be taken in a square yard or two of ooze. Most east coast waters are still rich fishing-grounds; but the salmon has vanished. East Anglia was never a great salmon haunt. Sir Thomas Browne could say that though 'no common fish in our rivers, many are taken in the Ouse,' and there are records in some of the old registers of stranded salmon up the Midland brooks, but for the salmon, fishermen always went north and west.





THE STACKYARD POPULATION

FOR farmer, or naturalist, or artist, with all who know anything of the country and, not least, country children, a stackyard is a place to rejoice in above most. It is a part of the scenery of the country. It is a sanctuary. It is full of life and movement at any hour of the day or night. The farmer perhaps rejoices less than he once did. Not so many years ago the wheatstacks, which were thatched with old-time thoroughness, stood 'foursquare to all the winds that blow' through autumn and winter into the spring. There is a case of an old farmer—he deserved more than a local name—who kept his stack fifty years. He swore a great oath that he would not sell until wheat was again £5 a quarter. Every two years his stacks were rethatched with the care that old port wine is recorked; and they were not taken down till a student interested in the life of seed asked leave of the executors to seek for a vital grain, if peradventure one was left. But like their master every one had died. It was not uncommon for a rick to remain unthreshed till the eve of the coming harvest. To-day it is quite uncommon to find a full, even a half-full, rickyard as late as February. Something more than a picturesque and satisfying diagram of plenty has been wiped out; for in these days this natural reserve of corn is cut clean away, and when February leads to spring, little corn but what is being

imported from overseas lies between the people and cereal starvation.

But the picture still remains of the old farmer walking every Sunday morning from his homestead on the hill to admire his rickyard, every rick raised on strong stone pillars with flat heads to keep off rats and mice. A miser telling his gold is an unlovely sight. The old farmer gloating with deep satisfaction over his golden grain, inspecting the trim pentagon ends, the straw eaves over the well walled length, or the exact circle of other stacks piled by a veteran artist in a dying craft—this picture raises the miser to a height of stalwart merit. A haystack represents wealth in a form that gives wonderful satisfaction to its owner, especially when the cutter begins to work and you see the virtue you always believed in announced in the solid wall, smelling of the meadows, with the 'bouquet' of a vintage. A trim stack, whether of hay or corn, is indeed a very satisfying object. The pity is that the biggest and finest groups of cornstacks disappear first for a very real reason in rural economy. All the threshing nowadays is done by travelling engines. The paraphernalia are very considerable. The better machines sort and guide all that comes to them : the good grain falls into one sack, the tails into another, dust and husks of different quality into others, and the straw is thrown out. A gang of men is required. The engine is heavy and valuable, needing a skilled mechanic ; and the machinery, though wonderfully strong, is intricate. Now that many farms take trouble to grow pure varieties of oats and wheat, very often selling seed, or, at any rate, growing their own, the machine must be very clean. The whole work of threshing depends on the imported men and machinery. The threshers indeed are now become quite a little craft of their own. They are almost houseless during the winter months.

They often cook their food like gipsies on fires in open-air encampments. They sleep on occasion in the straw from which they have threshed the grain. They are coming to possess some of the gipsy qualities. - In the exercise of their profession they usually give the preference to the bigger farmers, with the result on the country landscape that the bigger yards disappear first: sometimes, if wheat is chiefly grown, within a few weeks of the ending of harvest. The small men, who never dream of resorting to old methods, have to wait for the machines till they can get them. A small holder may find his stack half devoured before he can get it threshed. The rats have harboured in it and made excursions against his poultry and eggs; and he has to wait for the money which probably he seriously needs. In Ireland, a country of small holders, the haystacks are a feature of the landscape, very eloquent of the hand-to-mouth life of the people. As winter advances the round stacks gradually become thinner and thinner at the base, till finally they resemble mushrooms. They have served ever since winter began as a browsing-place and a shelter for the stock who thus eat rations never served out, as the poor do in London slums, where it is not the custom to have meal-times. In the end, the stacks as often as not topple over, having become too heavy in the head. You may see them in every state, from the dwindling but erect stack to the leaning tower, to the collapse. No emblem tells a more graphic tale of the state of the country than its stacks. The greatest contrast is between these tottering haystacks or amorphous cornstacks of the small freeholder, and the tight, well-clipped, geometric stacks, round or rectangular with pentagon ends and projecting eaves, such as you see on the great fen farms of Cambridgeshire, or indeed in any English county. Both seem quite integral to the landscape.

A haystack, however, has small virtue, as compared with a wheat or oat stack, for farmer or naturalist. It may house a few rabbits underneath, if it has been set on logs, and some birds may roost in its eaves of a chilly night, but there is an end. A cornstack is full of surprises from the blue shadows, which the impressionists quite rightly painted to it, to the astounding families of animals which inhabit its interior



'WELL-CLIPPED GEOMETRIC STACKS'

among the ears, so carefully hidden from common view. The time to visit a stackyard is at night, if you dare, for it is a strange and exciting place, more strange in its excitement than any wood. We all have felt a sort of fear or nervous tension on entering a deep wood at midnight, as if you might disturb things and be punished for your sacrilege. George Meredith, in a great naturalist's poem, has put the sensation into fit words :

'Enter these enchanted woods
You who dare.

Up the pine where sits the star
Rattles deep the moth-winged jar.
Each has business of his own ;
But should you distrust a tone,
Then beware.

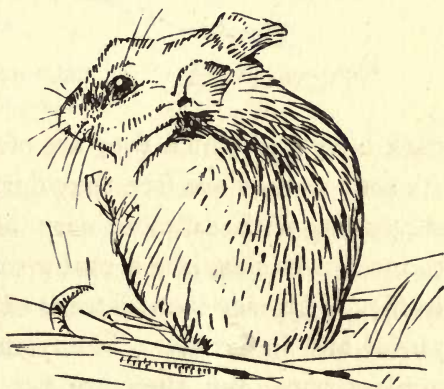
Shudder all the haunted roods,
All the eyeballs under hoods,
Shroud you in their glare.
Enter these enchanted woods
You who dare.'

The stackyard at night demands more daring. It requires more than a little nerve to avoid a start, which would quite spoil the game, when a great owl slipping unseen on velvet wing from behind the stack gives a screech just over your head as you stand glued against the stack or sit hidden under loose straw. Every night of their lives, it seems likely, the barndoor owls visit the stackyard. They usually wait till it is quite dark, and are often anticipated by the little Spanish owls, which come there soon after sundown, after they have been hawking along the hedgerow. But now and again you may find the great owls in the stack, apparently half asleep, in the daytime. They will fly there for refuge. A curious incident in the writer's garden illustrated this. One bright summer day an owl was seen roosting in a crab-apple tree, an unusual spot to select. But into the crab had grown up a tall and very free-flowering spiræa. The owl was perched right against the end of one of the long heads of blossoms; and it was quite difficult till you came within a short distance to tell where the flower ended and the owl began. The concealment was as near perfect as could be so far as adaptation to colour was concerned. As soon as he perceived himself discovered the owl flew straight off to a strawstack quite close by, and disappeared altogether in some loose straw. However at night the owls do not stay long: they come and catch their mouse and go. It is supposed that the shriek is uttered to startle the prey and make him disclose his place by a sudden movement; but it is a question whether the theory is sound. Observation in the stackyard does not support it. The whole place creaks and rustles

with life. You hear something moving close by you every minute. Beady eyes glint out of the straw within hand's reach. Brown forms make shadowy passages across the strips of moonlight, and disappear into the black shadows cut clean as if one were land and the other water. On the pent roof, after long rustling, the rats look out at first cautiously before they scamper about. Clearly the owls' cue here is silence; and from observation one would say that the shriek was quite independent of the strategy of hunting, though American observers maintain that its object is to make the victim proclaim its presence by movement.

The stackyard is fuller of life than any place in the countryside. When things go hard foxes and stoats come there as well as owls, intent on the same pursuit. The sparrows and finches which may be seen there by day in their hosts bear no comparison in numbers to the mammals.

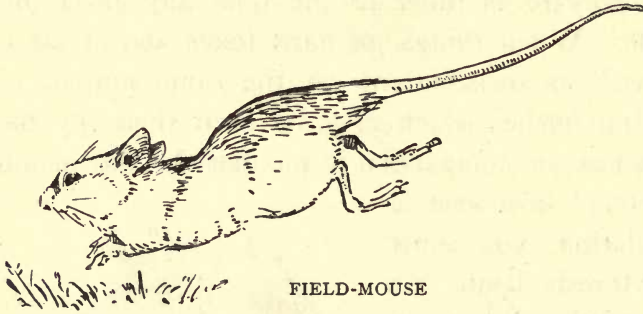
To understand how vast is this population, you must see a stack threshed out. As the men on the disappearing stack pull out neatly with their forks each uppermost sheaf and toss it to the receivers on the top of the thresher, mice will tumble down in showers. They are breeding in hosts at any time between November and February; and each brood



LONG-TAILED FIELD-MOUSE

is at least half a dozen. If a stack is left long and is not raised above reach, the mice and rats will devour much more than their tithe. The bottom layers will be just chaff, not worth the labour of the threshing-machine. The greediest

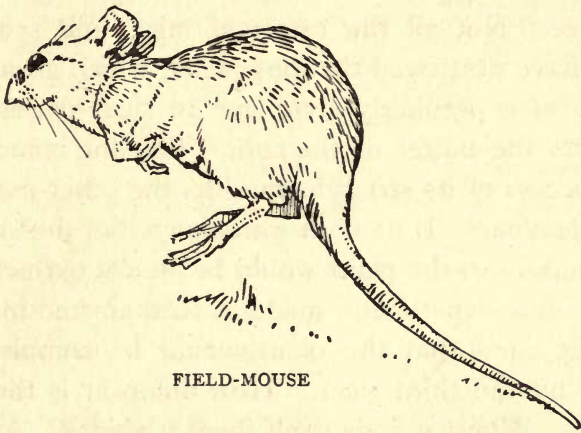
devourers are perhaps the rats. But their number in a stack is usually, but by no means always, small compared with the mice, who on the average do vastly more damage. The young mice, even if grown to full vitality, seem to be quite without fear, the only young things perhaps that are. They show no signs of alarm when you handle them; they will allow themselves to be recaptured at will. Sometimes, so it seems by their manner, they are quite dazed by the light. They have been bred in the very depth of the stack where light is even more conspicuously absent than air. Their antics recall those of the young calves when first let out from the



dark hovels in which they are often kept, especially in Wales. As soon as they are free they dart ahead wildly, pulling themselves up with extraordinary abruptness right against any chance obstacles, like a motor-car suddenly stopped by cross traffic. They see men as trees walking. The spectacle is both pitiful and ludicrous. The young mice run in just such an aimless way; but they are not, like the calves, frightened. The new objects simply stop them; and the man is too big to be frightening, if his hands are warm and comforting.

You will seldom see a stack threshed without the appearance of many boys with sticks and men with terriers. But not even English boys and fox-terriers are more ruthless to the escaping rats than are the domestic hens to the

escaping mice. If there is a considerable flock of farmyard hens, not a mouse will escape. They seem to be filled with a killing fury, and they kill with astonishing precision. One peck is usually enough to kill the mouse, which is a curiously tender animal in some respects. Most of the hens are content with killing; but a certain number attempt to eat the mice, usually suffering severely if the attempt is at all successful. The spectacle is thoroughly repulsive; and it is difficult to account for this instinct in hens. Mice are certainly not their



FIELD-MOUSE

natural food; and though hens in winter have a certain craving for animal food, the mouse is not the form in which they might be expected to take it. They are usually punished for their unnatural craving by a fit of sickness. But the hens are more eager to kill than animals to whom the mouse is proper prey. One has seen a cat sitting utterly regardless of the escaping mice, which were pursued *à outrance* by the hens.

It is comparatively easy to clear a standing stack of rats. It is impossible to clear out the mice. The rats make runs within the stack from floor to roof. If ferrets are put into a stack, you will as a rule first see the rats appear on the very roof or high up in the stack. A common method of destroy-

ing them is to put a dozen ferrets or so into a stack and shoot the rats as they appear on the roof. In threshing, the rats, which are as clever and courageous as any animal, will lurk in the bottom of the stack till the very last moment ; and many escape in this way. If a thin layer of the stack is left over at night, the 'falling house' will be completely deserted the next morning.

A stackyard full of fine ricks in October is often a green meadow at the end of February. If the spring has been open, corn and grass seed will have sprouted in brilliant luxuriance. Not all the rats and mice, and sparrows and finches, have destroyed the loose seed, which always seem to grow up of a peculiarly vivid hue in such places. But the grass gets the better of the corn. The one is incomparable in the success of its struggle for life, the other makes a very poor endeavour. If no corn were sown, but the crops left to seed themselves, the plant would be almost extinct in a year or two. One experiment, made at Rothamsted in Hertfordshire, suggested that the plant would be completely exterminated by the third year. How different is the vigour of the grass. Where it finds itself there it abides. Along virgin railways in a grassless country spring up, as it were, strips of meadow on either side the rails. The strips expand into any open country that lies alongside, so that in a few years, as has happened in parts of Newfoundland, fair pasture has sprung from the few seeds of Timothy grass dropped from passing loads of hay on the open trucks. One regrets this early extinction of the stackyards which rose so proudly in October ; but the levelled yard and the green floor do not give a sense of desolation such as the stackyard, seen not seldom in the west, where the roofs are green. The corn sprouts through the thatch, and the whole edifice appears to be mouldering away. Thence too even the rats and mice depart.

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