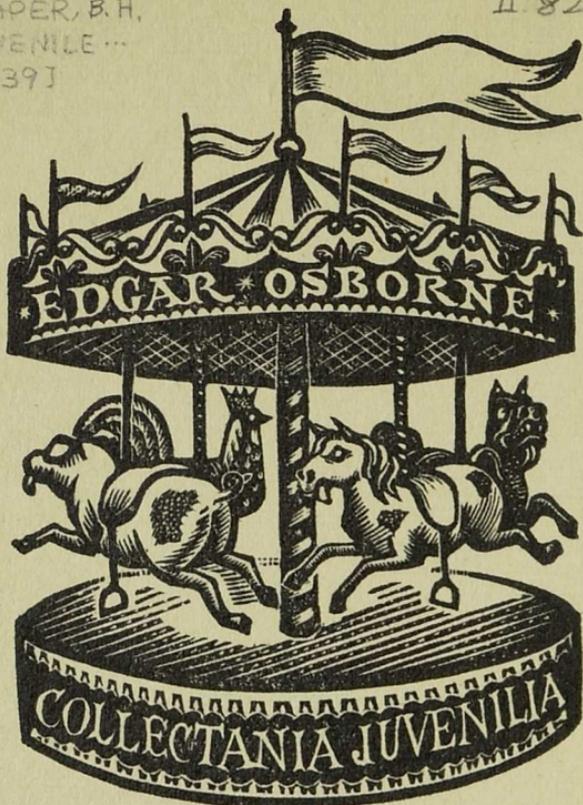




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JUVENILE ...
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THE
JUVENILE NATURALIST,
A
Country Book
for
YOUNG PEOPLE.

By the Rev. B. H. Drapers.

LONDON.

DARTON & CLARK, 58, HOLBORN HILL.



THE
JUVENILE NATURALIST;

OR,

WALKS

IN

Spring, Summer, Autumn, and Winter.

BY B. H. DRAPER.

"In a moral view, if one train of thinking be more desirable than another, it is that which regards the phenomena of nature, with a constant reference to a supreme intelligent Author."

PALEY.



VOL. I.—SPRING AND SUMMER.



LONDON:

DARTON AND CLARK, HOLBORN HILL.

CITY PRESS, 1, LONG LANE:
D. A. DOUDNEY

P R E F A C E.

IT is a remark of Paley, that, “ if one train of thinking be more desirable than another, it is that which regards the phenomena of nature, with a constant reference to a supreme, intelligent Author.” It is a leading design of the writer of this volume, to create this “ train of thinking.”

The minds of the young are ever active ; they will be employed about what is good or evil. One object, then, in a rational scheme of education, must ever be, to provide engagements which will tend to their improvement. And he who would be successful in this great work, must render his lessons attractive and delightful. The works of God will afford him an inexhaustible treasury for his aid. Parents and tutors should be on their watch to find for their dear charge, sources of legitimate pleasure ; or they will seek for gratification in forbidden and injurious paths ;

and especially, which cannot be too much guarded against, in the company of the profane and dissipated. The pages of this volume, the Author hopes, will show them, at least in some small degree, how he would wish them to open to the delighted eyes of the young, the ever-blooming, and ever-instructive leaves of the volume of creation. He is assured, that the scenes it describes, with a very little pains, may be carried out into action, since the book is only a transcript of what has constantly taken place in his own family. He is indeed greatly mistaken, if the habit of using the eyes and the understanding, in the way he has recommended, will not be a perpetual source of gratification and instruction.

The Author also wishes to acknowledge another object which he has in view in his publication,—it is, to extend more widely a feeling of humanity. He has never known a youth kill flies wantonly, or trample disdainfully on insects, or treat animals with cruelty, unless he was entirely ignorant of their formation and habits. He has always observed, that a moderate knowledge of natural history, has compelled an individual to look on even the meanest of the works of God, with a kind of reverence. He is ready

to say, whatever creature meets his eye,—How wonderful is its colouring,—how delicate its wings,—how surprising is its habits,—I must step aside, I cannot crush so much that is interesting. There is room enough for it and for me, in the large mansion of the world which God has built. On this important subject, the intelligent reader will thank me for the following beautiful sentiments from a letter of the late Sir W. Jones :—

“ I never could learn by what right, nor conceive with what feelings, a naturalist can occasion the misery of an innocent bird, and leave its young to perish in a cold nest, because it has gay plumage, and has never been accurately delineated ; or deprive even a butterfly of its natural enjoyments, because it has the misfortune to be rare and beautiful. Nor shall I ever forget the couplet of the Persian poet Ferdausi,

‘ Ah, spare yon emmet, rich in hoarded grain,
He lives with pleasure, and he dies with pain.’

“ This may be only a confession of weakness, and it certainly is not meant as a boast of peculiar sensibility ; but whatever name may be given to my opinion, it has such an effect on my conduct, that I never would suffer

the cocila, whose wild native wood-notes announce the approach of spring, to be caught in my garden, for the sake of comparing it with Buffon's description. Even when a fine young pangolin was brought to me, against my wish, from the mountains, I solicited his restoration to his beloved rocks, because I found it impossible to preserve him in comfort at a distance from them.' *

And if, only in a slight degree, the young may be really benefited, the great interests of humanity promoted, and the blessed Parent of all good glorified, the writer will rejoice, and be grateful, that the pleasant hours which he has employed in the production of these volumes, have not been spent in vain.

An index is appended, for facility of reference to the various subjects of the work.

Southampton.

* Lord Teignmouth's Life of Sir W. Jones, p. 399.

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THE
JUVENILE NATURALIST.

~~~~~  
SPRING.  
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WALK I.

CONTENTS.

THE SEASONS IN DIFFERENT CLIMATES—THEIR VARIED CHARMS—HOW THEY ARE PRODUCED—ST. PIERRE'S STRAWBERRY ROOT—NUMBER OF PLANTS—THE PRIMROSE—COWPER'S LINES ON THE SEASONS.

EDWARD. Mamma thinks we had better take our walk, before we sit down to our lessons this morning.

MR. PERCY. I think so too; it is so mild and fine, though the first of March, that we may regard it as the first morning in Spring. We have great reason

to be thankful to divine Providence, who has assigned us so great and so pleasing a variety in the succession of the seasons.

Then is it not so every where, Papa?

No, Edward; in the frigid, and in the torrid zones,—or in the coldest and warmest parts of our globe,—there are but two seasons; in Canada, Lapland, and the most northern parts of Sweden, the inhabitants have only winter and summer. The former lasts about eight months in the year.

I should not like eight months of winter, Papa!

Perhaps not; yet winter, through the divine goodness, even to the people who reside in the coldest regions, is not without its enjoyments. I was about to observe, that the transition from winter to summer; or, from frost and snow to great heat, is very sudden in the northern parts of the world. A traveller who spent some time in Lapland tells us, that the snow and ice began to melt about the twenty-third of June; and that they were quite gone at the close of the month. On the ninth of July, the fields were all

green ; by the seventeenth, the plants were at their full growth ; and in blossom and flower on the twenty-fifth. The fruits of various kinds were ripe on the second of August ; and on the tenth the people were gathering in their seeds. About the middle of August their winter began with frost and snow, and continued till near the end of the following June.

How long, and how dreary the winter must be, Papa. But where else, did you say, they have but two seasons ?

In India ; the one is dry and hot, and lasts about seven or eight months : the other, a period of gloom and rain ; through the remainder of the year, this is their winter. But in Europe, in the temperate zones, in which we find our beloved country happily placed, there are, as you know, four different seasons ; these are more or less distinctly marked as we advance towards the north or south. The prominent features of the different parts of the year, are finely described by a writer whose volume will be read whilst the seasons revolve. Can you repeat the lines I refer to, Edward ?

I think I can; they are in his Hymn,—

* * * “Forth in the pleasing SPRING
 Thy beauty walks, thy tenderness and love.
 Wide flush the fields; the softening air is balm;
 Echo the mountains round; the forest smiles;
 And every sense, and every heart is joy.
 Then comes thy glory in the SUMMER months,
 With light and heat refulgent. Then thy sun
 Shoots full perfection through the swelling year;
 And oft thy voice in dreadful thunder speaks;
 And oft, at dawn, deep noon, or falling eve,
 By brooks and groves, in hollow whispering gales.
 Thy bounty shines in AUTUMN unconfin'd,
 And spreads a common feast for all that lives!
 In WINTER, awful THOU! with clouds and storms
 Around Thee thrown, tempest o'er tempest roll'd,
 Majestic darkness! on the whirlwind's wing,
 Riding sublime, thou bidst the world adore,
 And humblest nature with thy northern blast.”

But, Papa, which season do you like the best?

You remind me, Edward, of the little boy, who when asked, whether he liked his father or his mother most; replied, “I love them both best.” So, to me, each season has its charms, though they are of

a different nature. Yet, I think, I rather prefer the spring. Its warm gales, the lustre of the new-born leaves, the songs of the birds, the whole creation awakening from its wintry slumbers, especially delights me. Spring too perhaps is more pleasing, because it comes after the cold and barren season; and because it promises a sweet and long succession of flowers, fruits, and fine weather. You now realize your wish, Edward, which you often expressed a month or two since, when the cold and the storms deprived us, and not unfrequently, of our usual walks, that this lovely period would arrive.

And next to the Spring, which of the other seasons do you like best, Papa?

I scarcely know how to answer you, Edward; I tell you, I enjoy them all; yet, perhaps, I prefer the autumn. The depth of winter and the height of summer, by their great heat and cold, inconvenience us many ways. Spring, I think, from its promising so much, imparts a more animated joy than autumn. But though the latter suggests the idea of decay, yet

it inspires a pensive pleasure, and is favourable to study and meditation.

It would be better, I think, Papa, if we were not to have any winter.

I think not; otherwise, God would have ordered it so. Whatever God has done, we may be sure, is on the whole, for the best; though we may not always see the reason for his conduct; nor can there be any doubt, but that the variety of the seasons adds very much to our enjoyment; just as the dark and rainy days, cause us to enjoy in a more lively manner those that are fine, and sunshiny. You would not so much enjoy a holiday as you do, if you had no labour, or times devoted to study.

But why are our seasons so different?

I think I have repeatedly shown you, when we have been talking on the globe. They naturally arise from the different positions which the earth occupies relative to the sun at these varied periods. You know, that the earth, besides its daily revolution on its own axis, from which arises day and night, has also

an annual course, in its orbit, or path, round the sun.

But how do you know this, Papa ?

Why, readily ; by the observation of the fixed stars. There are telescopes by which we can see them in the day ; and if, at the beginning of the year, we notice the sun to be in a line with one of them, we shall soon discover if we continue to look, that it will change its position, and be much to the east of him ; and this distance will be constantly increasing, till it has journeyed round the heavens, and arrives again in a line with the same star, where we first began to mark his progress. Thus it is evident that the earth has an annual course round the sun.

But the earth does not travel in an upright position around the sun ; his axis is inclined about twenty-three degrees and a half. Thus our great poet, Milton, says, the Creator bade

* * * “his angels turn askance

The poles of earth, twice ten degrees and more
From the sun's axle.”

By this beautiful arrangement, so worthy of the Divine wisdom, every part of the earth is enlightened, and enjoys its different seasons: but if it revolved perpendicularly, or upright, this could not be the case. By its position, the north pole is more fully presented to the sun in June, than at any other time in the year; so that in these northern regions it is summer. But, of course, the south pole is in an opposite direction, and it is winter in the parts of the earth which are south of the equator. In the month of December, the south pole is presented, in a similar manner to the sun, and then the inhabitants of the countries which lie round about it, in their turn enjoy summer, whilst it is winter in the northern parts of the earth. But, as I showed you just now on the globe, the people who live between the equator and the tropic of Cancer and that of Capricorn must have two summers every year.

I recollect now, Papa, that you did; and you said, that the sun was three millions of miles nearer to us at Christmas than at Midsummer; but I can't think

how this can be ; for, surely, then it would be warm in December, and cold in June ; which we all know it is not.

True, Edward ; but you forgot how I accounted for a very different result. I told you, that though the sun is nearer to us in winter than in summer, yet in the former season he does not rise very high in the heavens ; thus his beams shoot over us, and do not fall on the earth to warm it, as is the case in summer.

Thank you, Papa ; I understand it now. I see that from our situation on the globe, we have four seasons ; spring, the season which we now enjoy, when the trees, plants and flowers, bud and blossom, and in which heat is not very great, and the days and nights are nearly of equal length : summer, when the days are much longer than the night, and when the heat is so great that it ripens the fruits of the earth : autumn, when the heat abates, the fruits and seeds are gathered, and the days and nights are again as long as each other : and winter, which you said was

as a sabbath to the earth, when it seemed to rest from its labours, the cold increases, and the nights become much longer than the days.

You have given a just account of the seasons, Edward. In addition to what has been said about the different zones, it may be remarked, that the productions of the earth and waters in each of them are suited to the peculiar wants and circumstances of their inhabitants. The warm countries, for instance, are remarkable for an abundance of cooling fruits, and those that are cold for warm furs, suitable to their situation. I could readily adduce many other instances.

How is it that you know everything, Papa?

This is far from being the case, Edward. I know, indeed, somewhat of the works of God in general, as I have been accustomed to observe them carefully, and to read about them through the whole of my life. The more we know, Edward, the more conscious we shall be of the imperfection of our knowledge. The works of God are so comprehensive and boundless, that I

much question whether the best-informed individual knows all that is to be known about the most inconsiderable of them. Do you recollect the account St. Pierre gives of his strawberry plant? I pointed it out to you a few weeks since.



He says, that in three weeks thirty-seven different species of insects had visited it; and that a full history of the strawberry plant must have included an account of all these insects. Plants, he remarks, are the habitations of insects, and no one could give a proper account of a city who did not notice its inhabitants.

I think he also remarks, that, reasoning from analogy, it is credible there are animals feeding on the leaves of plants, like the cattle in our meadows, and on

our mountains; which repose under the shade of a down, imperceptible to the naked eye; and which, from goblets formed like so many suns, quaff nectar of the colour of gold and silver. Each part of the flower, he thinks, must present to them a spectacle of which we can form no idea. The yellow antheræ of flowers, suspended by fillets of white, exhibit to their eyes double rafters of gold, on pillars fairer than ivory; the corolla, an arch of unbounded magnitude, embellished with the ruby and the topaz. "Having examined," says he, "by the microscope, the flowers of thyme, I saw, with equal surprise and delight, superb flagons, with a long neck, of a substance resembling amethyst, from the gullets of which seemed to flow ingots of liquid gold. I have never made observation of the corolla simply, of the smallest flower, without finding it composed of an admirable substance, half transparent, studded with brilliants, and shining in the most lively colours."

And he mentions a botanist, Papa, who had made a collection of twenty-five thousand plants; and that he

believed those he had never seen would amount to four or five times as many.

He does ; you see, then, Edward, how impossible it is for any person to know everything. No one knows the entire history of a little plant. He who boasts that he knows everything, we may be sure has but very little knowledge. Sir Isaac Newton said, that, so far from entertaining any such views, he looked on himself as a child, who had been wandering with his play-fellows on the sea-shore ; but that he had been more fortunate in having, now and then, picked up a more shining pebble or shell than his companions. How true is the sentiment, that our modesty and humility will be in proportion to our attainments.

According to St. Pierre's account of the strawberry plant, it would seem that we do not fully know anything.

True, Edward ; yet the assertion of another foreign writer on this subject, appears to me a little extravagant ; he says, that if any one should live a hundred years, and devote the whole of his time to the particular study of a single plant, that, at the end of his

days, there would be many things in its nature and history, which he did not observe, or which he was incapable of perceiving.

But see, Papa, what a fine bunch of primroses there is on that bank; I will gather them.



Do; Kirke White prettily remarks, that Spring, in his conflict with Winter, threw the primrose on the bank, as a trophy of his victory over his stormy rival.

Here, Papa, they are; do smell them, they are so

sweet. And please tell me to what class and order they belong in the science of Botany.

I will do so with pleasure; give me one of them. Its technical name is, *primula vulgaris*. See, here are five stamens; it must belong then to the class Pentandria. In this same class are the cowslip, honeysuckle, violet, nightshade, currant, gooseberry, ivy, periwinkle, polyanthus, auricula, hops, elm, carrot, hemlock, parsnip, parsley, caraway, elder, and chickweed. The primrose has but one pointal; it is, therefore, in the first order, or Monogynia. As cultivated in our gardens, they are yellow, and white, of several shades, and red; and double white, red, and yellow. They continue in blossom five or six weeks. It is a pretty, modest, and fragrant flower.

Truly, I love all the seasons, with their varied and beautiful productions. I love to walk abroad, and muse on God's wisdom and loving-kindness in this his great temple. The fine verses of Cowper, in which he just touches on the seasons, indeed express the very feelings of my heart;—

Winter has a joy for me,
While the Saviour's charms I read,
Lowly, meek, from blemish free,
In the snow-drop's pensive head.

Spring returns, and brings along
Life-invigorating suns ;
Hark ! the turtle's plaintive song,
Seems to speak his dying groans !

Summer has a thousand charms,
All expressive of his worth ;
'Tis his sun that lights and warms,
His the air that cools the earth.

What ! has Autumn left to say,
Nothing of a Saviour's grace ?
Yes, the beams of milder day,
Tell me of his smiling face.

Light appears with early dawn ;
While the sun makes haste to rise,
See his bleeding beauties drawn
On the blushes of the skies.

Evening with a silent pace,
Slowly moving in the west,
Shows an emblem of his grace,
Points to an eternal rest.

WALK II.

CONTENTS.

THE WIND—ITS VELOCITY—TRADE WINDS—THE GOLDEN-CRESTED WREN
 —THE COMMON WREN—THE WRYNECK—THE BLACKTHORN—THE
 ELM—IVY—THE BLACKBIRD—THE NESTS OF BIRDS—THE ORIOBUS,
 AND TAYLOR BIRD.

WERE you not alarmed with the wind last night, Papa? I awoke several times, and I thought the very house shook.

I heard it, Edward, but was not much alarmed. I recollected, that the winds, no less than the waves, are under the control of the Most High; the raging storm does but fulfil his word.

Certainly, there is something very grand in the sound of the tempest; but do not such winds as we heard last night produce much mischief?

They do occasionally; you recollect, last winter they tore up, by the very roots, several of the large

trees in our beautiful avenue. And in each tempest, many vessels sink into the ocean, to rise no more. I am far from affirming, Edward, that storms do not often do much mischief. This, however, is one of the many ways in which the great Sovereign makes his creatures feel that he reigns, and that they are as nothing before him. Did he not do so, occasionally at least, the world would be full of impiety and atheism. Yet it cannot be denied, but that, on the whole, storms do much more good than harm; they scatter the noxious vapours, which would otherwise fill the air with disease and death. They cool the regions of the torrid zone, which, perhaps, would not be habitable without them. And, no doubt, they are useful in various ways with which we are unacquainted. Our mind should always be tranquillized by the certainty, that the most dreadful tempests, are under the Divine control; God says to the impetuous winds, "Hitherto shall ye come; but no farther!"

I should like to know, at what rate such a storm as that last night would drive a ship. Do you know, Papa?

Not exactly; but calculations have been made on the speed at which the air is impelled in various degrees of wind, which approach very near to the truth. A wind, scarcely perceptible, it is thought, moves at the rate of a mile an hour; a gentle, pleasant breeze, at the rate of four or five miles in the same time. A brisk gale advances onward from ten to fifteen miles; and a very brisk gale from twenty, to twenty-five. High winds, such as those of the last night, proceed from thirty to forty-five miles. And tempests move from fifty to eighty in the hour. Hurricanes in the West Indies, which tear up plantations and houses, are supposed to fly at the rate of one hundred miles in the same time, or even more.

I was reading in Cook's voyages, that at a particular place, he took advantage of the trade winds; what are these, Papa?

They are winds which always blow in one direction for a certain time, which is well-known, at a particular period of the year. Thus the monsoons blow for one half of the year in a direction from the

coast of India ; and the other half in a direction towards that continent ; and, of course, as this is well known, navigators take care to profit by the information, and make their voyages at such times as always to have favourable winds.

It is not improbable, that some species of birds take advantage of favourable winds to migrate from one country to another. Some of these have already returned to our island ; and all our usual residents will shortly be here.

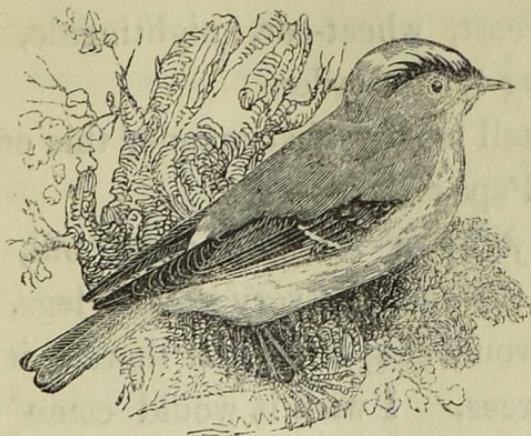
See, Papa, what a beautiful little bird that is which is hanging from that bough ; what can it be ? It is as fine as a humming bird, and has a golden tuft on its head.

Stand still, and do not frighten it away.

Is it not a humming bird, Papa ?

No, Edward, there are none in our country ; this is the golden-crested Wren. It is, indeed, as you properly called it, a beautiful creature, and is the smallest of our British birds ; it rarely weighs more

than a drachm. Many of them, it is said, migrate; but a few of them stay the whole of the year. No



doubt it was looking in the crevices of the bark of the oak, for insects, on which it feeds. I know the bird well. It is a native of Asia and America, as well as of Europe. It raises, sinks, or hides its orange-coloured crest just as it pleases. The neck and back are of a dark green. Its eyes are surrounded with a white circle; and its tail is brown, formed of twelve feathers, about an inch and a half long; but it is not forked, like those of other birds. It sings very

sweetly. In Ornithology it is termed *Motacilla Regulus*, and belongs to the order *Passeres*. The water-wag-tail, redstart, hedge-sparrow, black-cap, sedge-bird, red-breast, wheat-ear, nightingale, and many others, belong to this order.

Will you tell me in what manner this order is distinguished, Papa?

Principally by a straight weak bill, a tongue lacerated at the end, and very slender legs.

I wish it would sing now; but there,—it flies away, among the trees. I wish it would come to this oak again. It is not like the wren, whose nest I found in the thatch of our old wood-house, last year; though that sang very prettily. But it was not so beautiful a bird as this.

No, that was of another species; naturalists call it the *Motacilla Troglodytes*. Can you give me a description of it, Edward?

Not so well as you, Papa; but I will try. Let me see,—it was generally of a reddish brown, and lifted up its tail very gaily. The nest was made of moss,

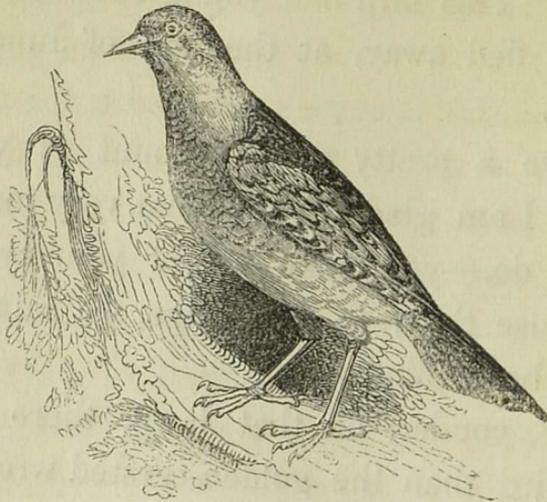
lined with feathers, and had a round hole in the middle for an entrance. There were ten eggs in it, which were nearly white, with a few red spots at the large end. This bird had young ones in April; and after these fled away, at the end of June she had some more.

You give a pretty good account of your wren, Edward. I am glad you do, what very many of our race never do,—you make use of your eyes. And, unless we use them to advantage, we might as well have been born blind.

But see, yonder, on that lawn, there is a more singular bird than the golden-crested wren. I have seen stuffed specimens of it in collections, repeatedly, but never saw one alive before; it is called the Jynx, or Wryneck. There is but one species, which is called the *Torquilla*. Its tongue is very long, and terminates in a hard point. Its colours are varied and beautiful. I am glad you have an opportunity of seeing it.

Pray, Papa, don't disturb him; I should like to ex-

amine him more closely; I'll try and get nearer to him. Ah! he won't stay; he is gone over the hedge in an instant.



It is a Bird of Passage, and generally visits us a little before the cuckoo. It squeaks, but has no song. Like the jay, it can erect the feathers on its head. It makes its nest of dry grass in the hollow of trees. It feeds on ants, and was, no doubt, searching for them when we saw him. The young ones, Mr. Pennant informs us, whilst in the nest hiss like a snake. It has

its name from a singular habit of twisting its neck, and bringing its head over its shoulders. A friend of mine has one in his museum; I will call on him, with you, and he will readily show it you.—But how pretty that blackthorn appears; it seems in full blossom. Break a branch off it, Edward.

Here it is,—but it is not so beautiful as the white-thorn. Is it not wonderful that the flowers should venture abroad whilst these cold north winds are blowing?

It appears, like all other things, at its appointed time; and comes in its season. In the botanical arrangement it is termed *prunus spinoza*. Perhaps you can tell me to what class and order it belongs?

Here are many stamens, and they stand on the cup, or calix. It must belong, then, to the class Icosandria; and as there is one pointal, it must belong to the first order, or monogynia. It produces sloes, which I much like towards the end of the year, when the frost has been on them.

Your account, Edward, is correct. It is very useful

for a fence, since it grows quick and close, and is full of sharp thorns. But what is that other twig you have in your hand?

It is a small branch I broke off the elm hedge over which the wryneck flew. And see, Papa, there are some pretty little red flowers on it; but how tiny they are.

They are the blossoms of the elm, or of the *ulmus campestris*.

I didn't know that the elm had any blossoms.

Very likely not; few persons know it; since the flowers, as you say, are so tiny, though very pretty, if seen through a glass. They come out before the full leaf, and soon pass away. But tell me its place in the Linnean system.

Here are five stamens; it must, therefore, be in the fifth class, or Pentandria; here are two pointals; it must belong to digynia, or the second order.

You are right, Edward. It is generally propagated by layers and shoots, rather than by seeds; though these are very numerous. It has been calculated,

that from one seed a tree springs which in the course of its existence produces one thousand five hundred and eighty-four millions of seeds. What an increase ! what a being is God, who has formed, and who every moment preserves the animal and the vegetable worlds !

The elm, in a suitable soil, grows to an immense size ; one is mentioned in Evelyn's *Sylva*, that grew in the park of Sir W. Bagot, in Staffordshire, which was seventeen feet diameter at its base ; and, when felled, extended one hundred and twenty feet. It contained timber to the amount of ninety-seven tons.

How wonderful, Papa ! See how the ivy runs up this large elm.* Does it not belong to the same class and order as the elm ?

It does. There are several kinds. That which runs up the side of our stable, is the Virginian creeper ; it is a native of North America, and was brought to us

* Botanists call it helix, the plant winding about.

from Canada. It is now very common; and readily covers any wall or building against which it is planted.



I have known it shoot twenty feet in a year. It is easily propagated by cuttings in autumn.

Does any animal eat it, Papa?

No doubt there are a number of insects that visit

it for various purposes. Horses and sheep will eat a little of it; but cows, goats, and other animals, will not. The plant is rather for ornament than use.

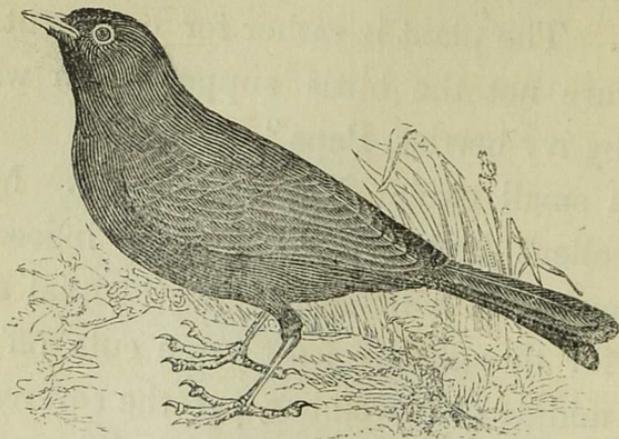
But are not the birds supported in winter and spring by ivy berries, Papa?

To a small extent, Edward, I think. Mr. White, the excellent Selbourne naturalist, indeed affirms, that they afford a noble and providential supply for them; for though the frost often cuts off the haws by the middle of November, yet the severest weather seldom injures the ivy berries. The opinion has been common, but not, I think, well-founded. Cowper says,—

* * * “berry-bearing thorns,
That feed the thrush,—whatever some suppose,—
Afford the smaller minstrels no supply;
The long protracted rigour of the year,
Thins all their numerous flocks.”

I think the poet is right; and not only as to “berry-bearing thorns,” but also as to the ivy-berries. Look at this tree; it is loaded with berries; but if the birds in

general had fed on them, there would, assuredly, have been but few left. Gather a bunch of them, Edward.



Ah, you have disturbed a Blackbird; most likely she has a nest; let me look. Here it is, and there are two eggs in it. Naturalists call it *turdus merula*; it is of the order of *Passeres*, of which I have told you before. The plumage is of a fine deep black; it forms a pretty contrast with the beak, and the edges of the eyes, which are a bright yellow. It is a shy bird, and builds very early in the season. See, the nest is formed of moss, dead grass, and clay; but the innermost lining is from the hay-stack.

Does not the Blackbird lay more than two eggs, Papa?

She lays four or five, of this bluish green colour, marked with dusky spots. The male sings nearly the whole of the summer, and the autumn.

How is it, Papa, that the different birds make such different nests?

Your question is a very difficult one, Edward; it arises from that varied instinct, or inclination, with which the Creator has endowed them.

Does not every blackbird make the same kind of nest?

Certainly; of the same form and materials; and they place it in very similar situations.

But the young birds of last year never saw a nest built; how, then, can they build the same sort of nest as that in which they were hatched?

They are taught to do so by Heaven; I know no better reply, Edward. The swallow, and the robin of Britain, build precisely the same kind of nest, as those of Germany, or America.

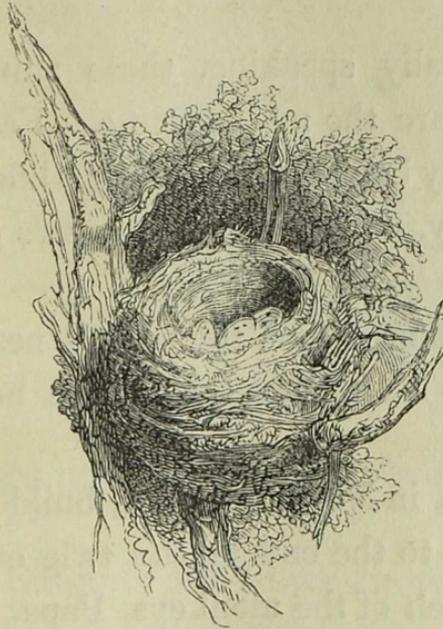
The Magpie's nest in the apple tree, in our orchard, Papa, was a very curious one; do you recollect, how



it was quite covered with thorns, leaving only a hole by which they might go in and out? Where does the eagle build her nest?

In high rocks, or on the summits of mountains. It is a singular fact, that parrots, and all birds with two toes forward and two backwards, lay their eggs in

the hollow of the trees. There are two beautiful nests, which I will show you, if I can find them; those of the titmouse, and the chaffinch. That of the former is like a large oval ball, with a hole just above the middle as an entrance; it is ingeniously hung in the midst of a bush whose moss is of the same colour as the outside of the nest. The nest of the chaffinch is



an exquisite specimen of the architecture of birds; it is one of the neatest productions I am acquainted with.

The inside is delicately lined with hair and feathers; and the outside carefully adorned with a silvery moss, and placed in a bush, or tree covered with the same article, so that it requires a strong and an attentive eye to find it. How admirably is this plan adapted for concealment!

All birds do not lay the same number of eggs, do they, Papa?

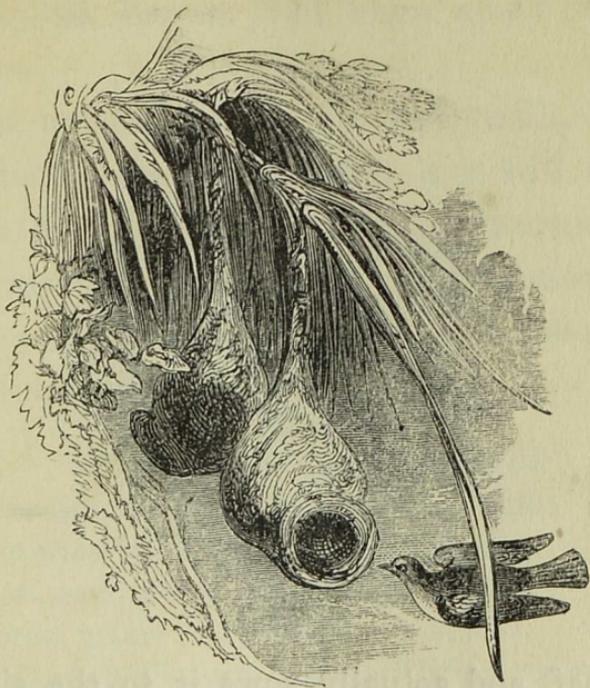
No; generally speaking, those animals that are most useful, are the most prolific. Eagles and rapacious birds, lay but very few eggs; whilst the domestic fowls lay many. Parrots lay only two or three white eggs.

When Mamma found the robin's nest in the garden, she told me of several curious nests in foreign countries.

The orioles, in North America, build a very curious nest, fastened to the end of the twig of a tree, to be out of the reach of the monkeys, Papa.

How very cunning! How do the birds know how large they should build their nests? And how do they

know, that sitting on their eggs will cause them to bring young birds? And how do they know when to



build their nest just in time for their eggs? And
how * * * * *

Pray stop, Edward; and let me answer one question first; or, rather, acknowledge that they are too difficult for me; which, indeed, they are. But what other nest did your Mamma mention?

One very surprising one; it was that of the Taylor bird.* It is a native of the East Indies. It picks up



a dead leaf, and actually sows it to the side of the living one. Its bill is the needle, and some fine fibres of the tree, the thread by which it fastens several leaves together; and when it has thus made a bag, it forms its nest in it. How curious, Papa.

* *Motacilla sutoria*.

It is a most singular account. The bird is of a delicate yellow colour about three inches long, and is very slight; so that its frail house would not readily break down.

But we must not protract our walk, Edward. Though the Spring has dawned, it is still cold, and the nights are yet frosty. I have observed, in the course of our walk, some leaves and blossoms which have been cut off. He observed the seasons with a careful eye who said,—

* * * “ Spring is but the child
Of churlish Winter, in her forward moods,
Discovering much the temper of her sire,
For oft, as if in her the stream of mild
Maternal nature had reversed its course ;
She brings her infants forth with many smiles ;
But, once delivered, kills them with a frown.”

WALK III.

CONTENTS.

THE WHITE FROST—EDIBLE BIRDS'-NESTS—MIGRATION OF BIRDS—
THE SAND MARTIN—THE HOUSE SWALLOW—THE HOUSE MARTIN—
THE SWIFT—HAYLEY'S LINES ON MIGRATION—VIOLETS—SUCCESSION
OF FLOWERS—THE LARK—HER SONG.

PAPA, did you observe the white frost which covered the shrubs before our house this morning?

Yes, Edward; it is not uncommon in the early part of the Spring.

Soon after I rose, I took a short walk; and my hat, and my hair that was exposed, were touched with the same whiteness.

Very likely; it arises from the light vapours which are floating in the air; these, falling on bodies that are colder, from the temperature of the atmosphere, lose their fluidity, and assume the beautiful appearance of the hoar frost.

Is it not surprising, Papa, that the cold frost of winter do not spoil all the eggs of the insects; and that the frost, in the spring nights, do not kill all the young broods, which are every where coming forth at this season?

It is; yet they do not. The eggs of the silkworm, and of other insects, have been exposed to the severest cold, and yet they have been uninjured. It may, however, not be improbable, that multitudes of young ones, in exposed situations, do not survive the frosts of a severe Spring.

There was one curious nest, Papa, of which Mamma told me, which I forgot to mention to you in our last walk.

I should think there are not only one, but many, Edward.

Not that she mentioned, Papa.

To what do you refer?

To birds' nests that the people eat in China, as a great luxury; they make soup of them.

These are built by a small Indian Swallow, called

the *hirundo esculenta*, from this very circumstance. The nest is formed of an animal jelly, or substance found on the sea beach; or, as some have thought, of the gum of the cedar. It is about the size of the egg of a goose, resembles isinglass, and readily dissolves in any liquid. They are abundant in the isle of Sumatra. Buffon informs us, that this Swallow is only two inches and a quarter long. The bill is black; the upper part of the body and its legs, are brown; its belly is of a dirty white; the tail is forked, and every feather of it is tipped with white. Mr. Marsden affirms, that the bird is as big as our common martin.

But can enough of their nests be found to make them an article of trade, Papa?

It is so affirmed. The Dutch export, from Batavia alone, one thousand pekuls annually; and each pekul weighs 125 pounds.

But if they are so good for soup in China, why would they not be so for soup in England?

I know not how it is, Edward, that they have not

found their way into our country. They are reserved, perhaps, as a luxury for a future generation.

Do you think, Papa, that all the birds are returned from the mild climates in which they spent the winter?

No, but they are constantly returning. As they do not leave us at once, so they do not return together. It has been remarked, that those who leave us the earliest return the first.

How do they know when to go, and when to return?

I cannot tell you, Edward; it is a secret which no one can fully explain. I know not who tells them that the snow, and frosts have left our country, and that they may again find food here; which you know they could not have done in the winter. Had some of them stayed with us, they would have perished. I know not what to say on the subject, but that it is the kind providence of God which inclines them to depart, and to return again at the proper season.

It does indeed seem, Papa, as if the Creator had guided them. How should they know their way else to a warmer climate? Why don't they take the wrong way,—the way to a severer winter? Do you know how far they go?

No; we are not certain; but we have reason to think, their flight is not less than two, three, or four hundred or thousand miles, and even much more. The sand martin is one of the first to return; and we are not far from the high banks in which they build. Ah, there is one has just passed us; I thought it was about the time of their return.

And I can see many of them flying round the bank where we saw them the last year.

Your sight is stronger than mine, Edward; yet I was pretty sure, when we saw one of them pass us just now, that we should soon see many more, and at the usual spot. There, the whole bank is studded over with the entrances to their habitations. I have watched them in the sand banks near Farnham in Surrey, and in Scotland; and I have always remarked,

that they frequent places that are near rivers, or pools of water.

What is the name by which naturalists distinguish this bird?

They call it, *Hirundo Viparia*, or the Shore Bird. Let us stand still, and look at them. See, the upper part of its body is of a mouse colour; and the bill and legs are dark.

But the throat and the under parts are white, Papa. How can it make those holes in the rock?

Its beak is rather hard and sharp, and well suited to the work. The hole is serpentine, and about two feet deep. There it places its nest; which is very unlike those of its tribe in general, as it is composed of fine grass and goose feathers, put together with but little art. After some years, the old holes are forsaken, and new ones are bored. Mr. White thinks they do so because the dwellings become foul, and full of vermin.

Of vermin, Papa!

Yes, there is a flea called the swallow flea; and

sometimes you may see them at the entrance of these holes, like bees at the entrance of the hive. The bird lay from four to six white eggs; and feed her young with large dragon flies.

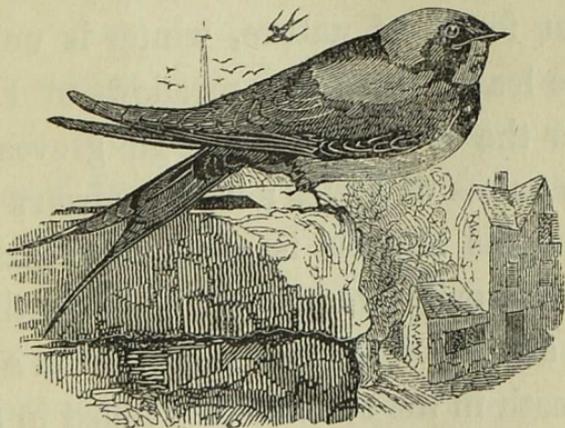
It does not fly like the other martins, Papa.

No, that is evident at first sight, they fly in jerks, or like the butterfly. They have no song, but are mute, with the exception of this harsh complaining note, which they make when any one comes near their nests. The house swallow, or the *hirundo rustica*, returns at the same time, or soon after, the sand martin.

I saw one yesterday, Papa; it was on the ground; and I could plainly mark the very forked tail, and the red spot on its forehead, and beneath its beak. I always thought its feathers were black; but those of the one I saw were of a glossy deep purple, or dark blue. His breast and belly were white, but tinged a little with red.

This was a male bird, Edward. You give a very good description of him. This species is generally

seen about the middle of April. It builds in chimneys, barns, or out-houses ; but most commonly in chimneys near which the smoke ascends, on account of the warmth ; and about five, six, or more feet from the top. When it takes a fly, a smart snap of the bill is heard. The notes of the swallow's song are very agreeable.



I have read of a pair of sparrows, Papa, who took possession of a martin's nest ; and, as they would not go out of it, the martins got some of their neighbours to help them stop up the entrance to the nest ; and so one of the sparrows became a prisoner.

That was very crafty of the martins, and a punish-

ment merited by the sparrow. He had clearly no right to seize on the house of another.

I am not surprised that Sir H. Davy says, "The swallow is one of my favourite birds, and a rival of the nightingale; for he glads my sense of hearing. He is the joyous prophet of the year, the harbinger of the best season; he has a life of enjoyment amongst the loveliest forms of nature, winter is unknown to him and he leaves the green meadows of England in autumn for the myrtle and orange groves of Italy, and for the palms of Africa; he has always objects of pursuit, and his success is sure. Even the beings selected for his prey, are poetical, and beautiful. The ephemeræ are saved by his means from a slow and lingering death in the evening, and killed in a moment when they have known nothing of life but pleasure. He is the constant destroyer of insects, the friend of man; and with the stork, and the ibis, may be regarded as a sacred bird. The instinct which gives him his appointed seasons, and which teaches him always when and where to move, may be regarded as

flowing from a Divine source ; and he belongs to the oracles of nature, which speak the awful and intelligible language of a present Deity." The *hirundo urtica*, or house martin, arrives soon after the swallow.

This is a pretty bird, and needs no description, as every one has seen them so often. Its tail is forked just the same as the swallow's. Is the fork of any use, Papa ?

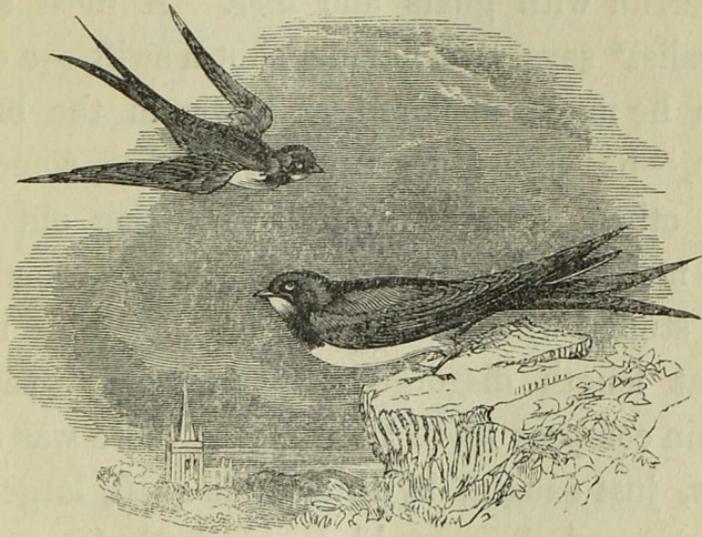
Yes, it enables the bird to turn more readily in pursuing its prey. The martin plays about, and enjoys himself, for a full month after his return, before he builds his nest, and provides for his young. Its house is formed like a mud wall, of dirt or clay, with bits of straw to hold it together. It is observable, that the parent birds labour only in the morning, that their work may have time to dry and harden as they advance. It erects about half an inch a day ; and in about ten or twelve days the structure is finished. They often build, if undisturbed, for some years in the same nest.

I have seen the old ones cling to the nest, whilst

they fed their young ones who put their heads out of it to receive their food. And after they have fled I have seen the parent birds feeding them in the air. It is a pretty sight; I have often stood still to see the swallow, or the martin, feeding their young. The swift, or the *hirundo apus*, is the last of this class which visits us. It comes the latest, and goes away the soonest of them. It flies more swiftly than any other of the swallow tribe, and is commonly on the wing for sixteen hours. It rests by clinging to a wall or building. Its feet are small, and it is extremely difficult for it to rise, when settled on the ground; which, indeed, is but rarely the case. A circumstance to which the following lines prettily and instructively allude;—

“Go, place the swallow on yon turfy bed,
Much will he struggle, but can never rise;
Go, raise him even with the daisy’s head,
And the poor flutterer like an arrow flies!
So oft thro’ life, the man of powers and worth,
Happy the caterer for an infant train,
Like Burns, must struggle on the base-worn earth,
While all his efforts to arise are vain;

Yet should the hand of relative or friend,
Just from the surface lift the suffering wight,
Soon would the wings of industry extend,
Soon would he rise from anguish to delight.
Go, then, ye affluent, go, your hands outstretch,
And from despair's dark verge, O raise the woe-worn wretch !”



The swift never settles on trees. She is so attached to her young, that she will suffer herself to be seized, rather than quit the nest. The swift is an inhabitant of every part of Europe, of the Cape of Good Hope, and of America.

Are any of the swallow tribe injurious, Papa?

No, I think not. Virgil says in his *Georgics*, that they kill the bees; but I do not believe that this is the case. We are certain that they do much good. If it were not for the habits of these birds, we should be overrun with gnats and flies. A most sensible Naturalist* says, that having shot a swift,—a circumstance he much deplored, as it was in the breeding season,—he observed a number of flies, some mutilated, others scarcely injured, crawling out of the bird's mouth; the throat and pouch seemed absolutely stuffed with them: and an incredible number was at length disgorged. "I speak," says he, "within compass when I state, that there was a mass of flies, just caught, by this single swift, larger than, when pressed close, could conveniently be contained in the bowl of an ordinary table-spoon." I am indeed of opinion, that all the swallow tribe do much good, and no harm."

* Capt. Th. Brown.

You gave me, last year, when the swallows were going away, some pretty lines of Mr. Hayley's to learn.

I recollect I did. Can you repeat them?

I think I can ;—

“ Ye gentle birds, that perch aloof,
And smooth your pinions on my roof,
Preparing for departure hence,
Ere Winter's angry threats commence ;
Like you, my soul would smooth her plume,
For longer flights beyond the tomb.

May God, by whom is seen and heard,
Departing man, and wand'ring bird,
In mercy mark me for his own,
And guide me to the land unknown !”

But, Papa, do you not smell the violets? They abound in this hedgerow. O, I see them ; here they are !

They are, indeed, very fragrant ; and they have a lustre and beauty, which remind us of our Lord's language, that even Solomon, in all his glory, was not arrayed as one of these ! The violet is one of the

early flowers which assure us that the winter is over and gone, and that the animating spring is revisiting our world. The flower is doubly welcome to me; for it says, you shall again roam through the blooming vale, and climb up the high mountain. You shall again behold the happy groups of the village children culling the sweet cowslips from the verdant mead. Again, by the thick copse, you will pause to hear the nightingale's enchanting song. The fine blossoms, reflecting all the vivid tints of the bow of heaven, will once more adorn your orchard and garden.

This little flower of the field reminds us of Him, who created, and who supports all things by the word of his power. It is He who bids the seasons revolve in grateful succession. It says,—behold the accomplishment of his word,—that, “while the earth remaineth, seed-time and harvest, cold and heat, summer and winter, and day and night, shall not cease.”

This little flower speaks of his goodness, as well as of his faithfulness. All may be delighted with its fragrance, from the child, and he who is hoary with

to the vagrant boy who wanders almost destitute of a home, and the monarch on his throne,

* * * * “ The hand,
Which scatters violets under every thorn
Forbids that sweets like these should be confin'd
Within the limits of the rich man's wall.”

“ How manifold are his works ! In wisdom he has made them all ! The earth is full of his riches ! ”
How blind must he be, who does not recognize his hand ; how ungrateful and depraved, who does not adore his goodness !

* * * * “ One Spirit—His,
Who wore the platted thorns on bleeding brows,
Rules universal nature. Not a flower
But shows some touch, in freckle, streak, or stain,
Of his unrivalled pencil ! He inspires
Their balmy odours.
Happy, who walk with him !
His presence, who made all so fair, perceiv'd,
Makes all still fairer.”

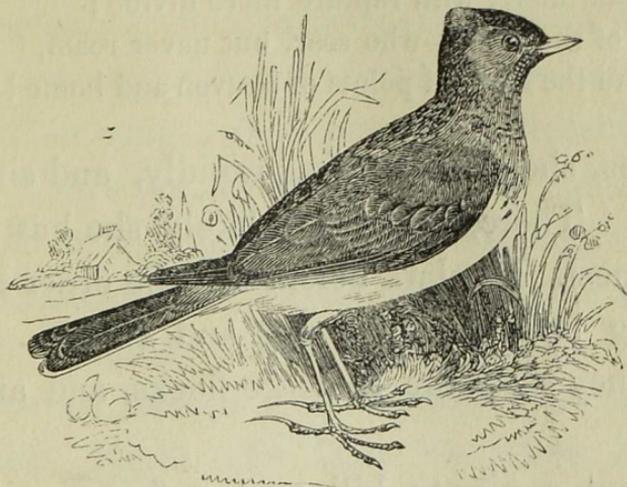
What a beautiful succession there is of flowers, Papa. Mamma remarked, that as they come month after month, we have leisure to examine their beauty,

and to enjoy their fragrance, which we could not do, if they came altogether.

True. The violet is one of the first of the spring flowers. The purple, white, and variegated lilac, also adorn our garden; the hyacinth, delighting the sight and the smell; the imperial crown flower, with its starry leaves, and red and yellow blossom; the copious flowers of the woodbine with their delicious sweets; the delicate and lovely jessamine; the auricula, richer in its texture, than the finest satin or velvet; the tulip with its varied and splendid colours; and a thousand more, one after the other, will regale our senses, and delight our eyes. But, Edward, you did not tell me the botanic class to which the violet belongs. We forgot our science amidst the enjoyment of its fragrance.

We have already had several flowers of the same class. The primrose, and the cowslip, belong to it. Here are five stamens, it must be of the class Pentandria; here is one pointal; it must be, therefore, of the first order, monogynia.

You are right. But see, how the little Lark ascends to heaven and hark ! how he warbles his evening



song. Perhaps he is bidding farewell to the setting sun. Already, he appears only as a speck in the vast expanse. I cannot even discern him without my eye-glass. Well does Wordsworth say,—

“Ethereal minstrel ! Pilgrim of the sky !
Dost thou despise the earth where cares abound ?
Or while thy wings aspire, are heart and eye
Both with thy nest upon the dewy ground ?

“ Leave to the nightingale her shady wood,—
A privacy of glorious light is thine ;
Whence thou dost pour upon the world a flood
Of harmony, with rapture more divine ;
Type of the wise,—who soar, but never roam,
True to the kindred points of heaven and home ! ”

But see, she is descending rapidly, and singing all the way. There,—it is very likely she has dropped into her nest. The lark belongs to the order Passeres. They sing both in the spring and autumn. In the winter, they assemble in large flocks, and are killed for food.

Is it not a pity to kill such a fine singing bird, Papa ?

The thought of killing it, Edward, is by no means a pleasant one to me. But if they were not taken, they would perhaps be inconveniently numerous. In the neighbourhood of Dunstable, it is said, that between four and five thousand are caught, and sent to the London market. And they are still more plentiful on the continent. Nearly a thousand pounds per

annum is raised at Leipsic, as a tax on them. And they equally abound in other parts of Germany.

Do you think the one which has just come down from heaven was singing her evening song of praise?

I cannot say, Edward; for I understand only the music of her song. It is, however, a pleasing thought that all God's works declare his glory; and, in some way, celebrate his praise. And nothing, surely, can be more rational, than to offer thanksgiving with every opening morning, and closing evening. Each day and night we receive new favours from the hand of the Most High. In Him we "live, and move, and have our being." Our lives should be one perpetual hymn of praise. We should be continually saying with Israel's devout Monarch, "Thou art my God, and I will praise thee; thou art my God, and I will exalt thee!"

WALK IV.

CONTENTS.

WHEAT—SEEDS—ORDERS OF INSECTS—BUTTERFLIES—THE SNAKE—THE
VIPER—THE CUCKOO—THE BEECH—THE HUES OF TREES—THE HAW-
THORN,—AND ITS DIFFERENT SPECIES.

PAPA, the men are sowing wheat in the field a little below our house. Did you tell them to do so?

Yes; it is spring wheat. It is so called because it will be ripe about the same time with the other wheat, though it is sown in March.

I have been thinking about it, Papa. How wonderful it is, that one corn should produce so many grains.

All seeds may well excite our astonishment. Who could have supposed, that all the parts of the mighty oak were wrapt up in the little acorn! Yet it must be so, or they could not come out of it. All seeds contain in them the root, stem, leaves, blossoms, and fruit of the future plant.

But wheat, Papa, seems more important than all the rest put together, does it not?

Your assertion, Edward, involves so much in it, that I know not whether it is literally true; but wheat, certainly, is the most important grain which God has given us.

Will you tell me, what place it occupies in the Linnean system? Did you not say, it was among the grasses?

It is; it has three stamens: and, of course, is in the class Triandria; and two pointals, and is, therefore, of Dyginia, or the second order. Barley and grass belong to the same family. Its name, among botanists, is triticum. There are many kinds of wheat. Four are natives of Britain; the rest are of foreign origin.

You were just now, Papa, speaking of seeds. I can't think how it is, as no one sows them, that the weeds are to be found every where.

In very many cases the seeds are eaten by birds, and, as they are not digested, they are dropped by them in different situations. Not a few are driven

about, to a great extent, by the winds. Some, you know, like the seed of the dandelion, are furnished with down, which is a sort of wings, and are readily carried, even by a gentle gale, a great way. Some seeds are thrown, by an elastic force, when the seed-vessels burst, to a considerable distance.

And I think you said, Papa, that seeds were buried for a long time in the ground, and yet they did not lose their power of springing up, when by digging, or ploughing, they were brought near enough to the surface.

The vitality of seeds is very remarkable. Mr. White mentions, that when some old beech trees were cleared away in a wood near him, the naked ground became, in a year or two, covered with strawberries, the seeds of which must have lain in the ground for an age at least. Earth brought up from an immense depth, though covered with a glass, so that no seeds could drop on it, has in a little while been covered with plants; the seeds of which must have been hid in the depths for time immemorial. If my memory does not

fail me, I think I have read a well-authenticated account of the vegetation of some grains of wheat which were discovered in an Egyptian Mummy.

Why they must have been there a very long time.

Yes, indeed; for one or two thousand years I apprehend.

How wonderful it is, that they should not have perished.

It is indeed. God appears as great in the minute as in the vast,—as great in wrapping up the vast oak in the little acorn, as in the revolution of a world round the sun. The utmost power and skill of man could not effect either of them; they are alike the work of omnipotence. And so is that fine butterfly which has just settled on the flower before us. None but a divine hand, could have formed those beautiful wings. I think, Edward, you must recollect how Linnæus classes the insect world.

Into seven orders; he distinguishes them by their wings, or the want of them.

Mention them; it is beneficial to repeat what we

know imperfectly, till we are well acquainted with the subject.

The first order is Coleoptera; or those that have their wings in a sheath, as the word imports.

True, all the names refer to the distinction of the orders. The beetle tribes are included in it. There are about sixty genera, including more than a thousand species.

The next order is Hemiptera, or half winged; grasshoppers and locusts are in this class. The third order is Lepidoptera, or scaly-winged. It includes moths and butterflies. Neuroptera, or nerve-winged, is the fourth, they have no sting. Dragon-flies are of this order. Hymenoptera, or those with a membrane-wing, as wasps, bees, ants, form the fifth order; they have a sting. I forget the other two.

The sixth order is called Diptera, or two-winged: flies and gnats belong to it. And the last Aptera, or without wings; as spiders and fleas. This great naturalist places shrimps, scales, and lobsters, in this order.

That is strange, Papa. And, I do not see why

butterflies are placed in the Lepidoptera, or scaly-winged order. Where are its scales?

Look on your hands; the one you caught just now, I think, has left some of his scales on them.

No; here is only a little mealy powder.

Seen through a good glass, they are minute scales of different sizes and colours. They are in the shape of a fan, and lap over one another, like tiles on the roof of a house. They have been called feathers, but are rather to be regarded as plates or scales. "In down," says one of our poets,

* * * "of every variegated dye,
Shines, fluttering soft, the gaudy butterfly;
That powder, which thy spoiling hand disdains,
The form of scales, and painted plumes contains;
Nor courts can more magnificence express,
In all their blaze of gems, and pomp of dress."

What a beautiful painting you have, Papa, of a large butterfly, in your study.

It is; but seen through the microscope, it is rough, and has no beauty; whilst the insect itself is the more

beautiful, the more closely it is examined. The assertion of Mrs. Barbauld is correct, "that none can follow Nature's pencil here:" we may say of them, what cannot be said of the most finished picture,— "their wings," are

* * * "with azure, green, and purple gloss'd;
Studded with colour'd eyes, with gems emboss'd,
Inlaid with pearls, and mark'd with various stains
Of lively crimson thro' their dusky veins."

Does not the butterfly feed on the honey of flowers?

It does; and it has a highly curious instrument by which it does so. It is a spiral substance of eight rounds, which winds up like the spring of a watch; it has two tubes, or little organs of suction, at the end of this proboscis, by which it gains its nourishment from flowers, by a mere touch of them. It is affirmed that there are, in our own country, as many as twelve hundred species of butterflies.

How surprising it is, that the butterfly should spring out of a caterpillar!

It is; but we are sure it is the case; for we see it eat its fill, change, and retire from our view,—and

* * * * “In its lonely cell,
 Forget the sun, and bid the world farewell.
 But when revolving months have won their way,
 When smile the woods, and when the zephyrs play,
 When laughs the vivid world in summer’s bloom,
 He bursts, and flies triumphant from the tomb;
 Proud of his various beauties, wings his way,
 And spoils the fairest flow’rs, himself more fair than they !”

“See,” says Linnæus, “the large, elegant, painted wings of the butterfly: four in number, covered with small imbricated scales; with these it sustains itself in the air the whole day, rivalling the flight of birds, and the brilliancy of the peacock. Consider this insect through the wonderful progress of its life; how different is the first period of its being from the second, and both from the parent insect. Its changes are an inexplicable enigma to us; we see a green caterpillar, furnished with sixteen feet, creeping, hairy, and feeding on the leaves of a plant; this is changed into a chry-

salis, smooth, of a golden lustre, hanging suspended to a fixed point, without feet, and subsisting without food ; this insect again undergoes another transformation, acquires wings and six feet, and becomes a variegated butterfly, living by suction upon the honey of plants. What has nature produced more worthy of our admiration? Such an animal, coming upon the stage of the world, and playing its part there under so many different masks !” Well does Paley remark, that “ the production of beauty was as much in the Creator’s mind when painting a butterfly, as in giving symmetry to the human form.”

The butterflies in foreign countries, are far more numerous, and much more remarkable for their size and beauty, than any in Britain. Lander, in his travels in Africa, says, “ There was one beautiful sight which we cannot but mention,—an incredible number of butterflies fluttered about us like bees. They were variegated by the most brilliant tints. The wings of some were of shining green, edged and sprinkled with gold ; others were of sky blue and silver ; others of purple

and gold, delightfully blending together; and the wings of some were like dark silk velvet, trimmed and braided with lace." On another occasion he says, "Millions of butterflies fluttered around us, and literally hid from our sight, every thing but their own variegated and beautiful wings."*

How I should like to have seen them.

Did not our minister refer to this insect last Lord's day?

Yes, and I thought with much propriety. Its changes form a fine illustration of the Apostle's striking inquiry, "Why should it be thought a thing incredible, that GOD should raise the dead?"—But what have we here, Edward?

It is a large snake, Papa; but it is dead, or I should have ran away from it.

That would have been very silly: the poor reptile has no sting, and could not have injured you. Besides, he would have got off, had he been alive, as fast as he

* Travels in Africa, vol. i., p. 62. 71.

could; much more frightened at you, than you were at him. I should have thought you had been more of a man, Edward, than to have been afraid of a harmless snake.

Why, our servant, John, when I went out with him last week, showed me a blind worm, and said it would sting any one dreadfully.

He was mistaken; the blind worm has no sting, and cannot do harm to any one. I have known some affected young ladies much alarmed at the sight of a toad or a frog; and ready to go into hysterics at the formidable appearance of a mouse or a spider. Nothing can be more silly than such conduct. Pray, Edward, call reason to your aid, and do not at all resemble these foolish persons.

Will you tell me all about the snake?

It lays a chain of eggs of twelve, or more, in a dunghill, or melon or cucumber bed, which are hatched by the heat of the next spring. The snake creeps out of its skin annually, and has a new one. When it has eaten a good meal of frogs, or other reptiles, it

falls into a torpor, and does not eat for some time; it then awakens, and goes in search of its prey.

But will not the viper sting, Papa?

It will; but salad oil, immediately applied, is said to be a certain remedy. Their eggs are hatched within them. Mr. White informs us, that he once surprised one basking in the sun; having killed, and opened it, fifteen young ones crept out of their parent; the shortest of them were seven inches. "They issued," he says, "into the world with the true viper spirit about them; twisting and wriggling about, setting themselves up, and gaping very wide, when touched with a stick, showing manifest tokens of menace and defiance." Vipers have been kept six months without food, and yet have been lively. Their flesh has been used for medicinal purposes.

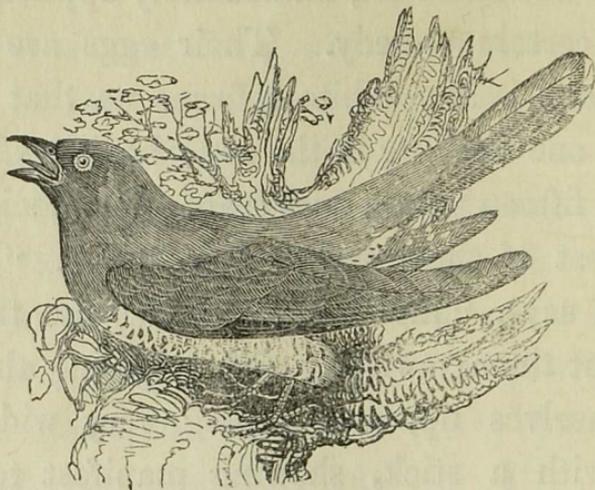
But how can they catch them?

They fasten a cleft stick over their heads, and catch hold of their tails; and so put them into a bag.

There,—Papa,—did you not hear the Cuckoo? *

* Cuculus Canorus.

No ;—listen,—yes, I now hear him. I wondered we had not heard him before ; I am always pleased to hear this bird of the spring. Like most of our birds, he



sings only to the end of June. He lives on insects, fruit, and the eggs of smaller birds. I never hear this singular bird without thinking of the pretty lines of Logan ; and repeating them, in thought, if not audibly ;—

“ Delightful visitant ! with thee
I hail the time of flowers,
And hear the sound of music sweet,
From birds among the bowers.

The school-boy wand'ring thro' the wood,
To pull the primrose gay,
Starts,—the new voice of spring to hear,
And imitates thy lay.

Sweet bird! thy bow'r is ever green,
Thy sky is ever clear;
Thou hast no sorrow in thy song,
No winter in thy year.

O could I fly, I'd fly with thee,
We'd make, with joyful wing,
Our annual visit o'er the globe,
Companions of the spring!"

Under what class is the cuckoo placed in natural history?

It is in the order of Picæ; whose characters are, a bill, smooth and more or less bending; the nostrils bounded by a small rim; the tongue short and pointed; and the feet and toes formed for climbing.

Does the hen cuckoo sing? And where does she build her nest? And how many eggs does she lay?

Not so fast, Edward; one question is enough at a time. No, the hen has scarcely any voice. And

she does not build any nest. She lays her eggs in the nest of the hedge-sparrow, water-wag-tail, titlark, red-breast, and in some others; more commonly in that of the hedge-sparrow. Her egg is about the same size; but, in colour, very much like that of the house-sparrow. She lays a number of eggs; one in a nest, generally, but sometimes two.

But how do you know they lay more than one or two?

Very well; because the hen cuckoo has been shot, and opened; and many eggs have been found in her.

But how is it that the cuckoo does not sit on her eggs and hatch them herself?

I cannot tell you. They leave the country about the beginning of July; and, therefore, they don't stay long enough.

But why don't they stay long enough?

I know not, Edward; indeed no one can tell you.

What, then, do the old ones leave all the young ones behind? And when do they go?

Yes, they leave them behind; and I know not when they go. As we never see any of them together,

I am rather of opinion, that they each depart as soon as they are sufficiently strong to bear the flight.

But how do they know the way they should go ?

I cannot tell, Edward ; very much of the history of this singular bird is hid in obscurity.

But how is it the hedge-sparrow will feed the young one of another bird ? And how can she get enough food for her own young ones, and for such a big bird as a cuckoo ?

I will tell you what Dr. Jenner says on these subjects. " I examined," says he, " the nest of a hedge-sparrow, which contained a cuckoo's, and three of the bird's own blue eggs. On looking at it the day following, I found the bird had hatched, but that there was only one cuckoo, and a young hedge-sparrow. The nest was placed so near the extremity of a hedge, that I could distinctly see what was going forward in it ; and, to my astonishment, I saw the young cuckoo, though so newly hatched, in the act of turning out the young hedge-sparrow."

What a shame, Papa !

It does, indeed, seem a little hard to turn a person out of his own house and bed. "The mode of accomplishing this was very curious. The little animal, with the assistance of its rump and wings, contrived to get the bird upon its back; and making a lodgment for the burden by elevating its elbows, clambered backward with it up the side of the nest, till it reached the top; where, resting for a moment, it threw off its load with a jerk, and quite disengaged it from the nest. It remained in this situation a short time, feeling about with the extremities of its wings, as if to be convinced whether the business was properly executed, and then dropped into the nest again. I afterwards put in an egg; and this, by a similar process, was conveyed to the edge of the nest, and thrown out."

It is wonderful how it can do this.

Its shape is well adapted to the purpose; for, different from other newly-hatched birds, its back is broad, with a considerable depression in the middle. This is filled up, as the birds arrive at maturity. I ap-

prehend it would be impossible for a hedge-sparrow to maintain more than one cuckoo, as it is very voracious.

But would one young cuckoo turn out another?

Yes; Dr. Jenner informs us, that he saw two cuckoos, and a hedge-sparrow, hatched in the same nest, and one egg of the sparrow unhatched. In a few hours after, a contest began between the cuckoos for the possession of the nest, which continued undetermined till the next afternoon, when one of them, which was somewhat superior in size, turned out the other, together with the young hedge-sparrow and the egg. The contest was very remarkable; the combatants appeared alternately to have the advantage, as each carried the other several times nearly to the top of the nest, and then sunk down again, oppressed by the weight of its burden; till, at length, after various efforts, the strongest prevailed."

Well, how strange it is, Papa!

It is; but the works of God are all wonderful, as

well as manifold. The more closely we examine them, the more we are convinced, that they are "past finding out." But the afternoon is warm, let us sit down a little, Edward, under the shade of this wide-spreading beech tree. Does it remind you, Edward, of one of your prettiest Latin lessons?

Yes, Papa, of the first eclogue of Virgil. And the tree is in blossom; I can tell, easily, to what class it belongs. It has twelve stamens, and belongs to the eleventh class, which is called Dodecandria; it has three pointals, and is of the trigynia, or third order. Virgil gives me its Latin name; it is FAGUS.

Mr. White says, "Whether we consider its smooth rind or bark, its glossy foliage or graceful pendulous boughs, it is the most lovely of all the forest trees." I think he is right; it is the most lovely; but the oak excels it in dignity and majesty; and it is useful as well as graceful. The turners make a variety of articles from the beech. It is fashioned into chairs, bedsteads, and various articles of furniture. Its fruit serves to

fatten deer and swine. The blackbird and thrush live on its seed in winter. It is also said, that excellent mattresses are made of its dried leaves.

You forgot, Papa, how fond my little squirrel is of the nuts.

No, I did not ; one cannot name every thing at once. How prettily our poet notices some of the features, if I may so speak, of our principal trees. "No tree," he says,

* * " In all the grove but has its charms,
Tho' each its hue peculiar ; paler some,
And of a wannish grey ; the willow such,
And poplar, that with silver lines his leaf,
And ash, far-stretching his umbrageous arm ;
Of deeper green the elm ; and deeper still,
Lord of the woods, the long-surviving oak.
Some glossy-leaved, and shining in the sun,
The maple, and the beech, of oily nuts
Prolific, and the lime at dewy eve
Diffusing odours ; nor unnoted pass
The sycamore, capricious in attire,
Now green, now tawny ; and, ere autumn yet
Has changed the woods, in scarlet honours bright."

But did you observe, Edward, how beautifully the hawthorn is coming into blossom? *

I did; the country will soon present,

One boundless blush, one white empurpled shower
Of mingled blossoms!

I told you about this beautiful production a day or two since, when you brought me a little branch of it. You can, I think, readily inform me to what part of the Linnean system it belongs? Here is a flower in full bloom to guide you.

It is of the class Icosandria; in which the stamens always stand on the calix, or cup of the flower. It has twenty stamens; and is of the second order, or Digynia, as it has two pointals. This order contains no other plant. You said, that the cherry, plum, pear, apple, medlar, strawberry, raspberry, rose, and mountain-ash, all belong to this class.

They do; it is quite a fruit class. There are many

* *Cratægus*.

varieties of this beautiful shrub; there is the large scarlet haw, which is very splendid, and is often met with in gardens and pleasure grounds, to which it is a great ornament. This is a variety of the common haw, produced by the art of the nurseryman. Then there is a yellow haw, which is a very fine plant; its buds are yellow, and its fruit of the colour of gold. It retains its berries all the winter. It was first brought from Virginia. A third variety is the maple-leaved haw; it has but few thorns, and will grow twenty feet high. The leaves are of a whitish green colour, and are like those of the maple. The flowers appear in large clusters in June, and its fruit is of a shining red. A fourth species, is of a double-blossomed hawthorn, and is one of the finest ornaments of the plantation or garden. The flowers come out in large bunches in May, and the plant is usually covered with them. At first their colour is a delicate white; but it gradually changes to a faint red.

I did not know there were so many kinds of the haw. But I have heard my Aunt name the Glaston-

bury thorn, which blossoms on Christmas-day, and which was planted by Joseph of Arimathæa; is it so?

This thorn does blossom in winter; but that it grew, as is affirmed, from the walking stick of Joseph of Arimathæa, or that this good man was ever in Britain, are, no doubt, mere fables.

How is it that all the trees and flowers are coming out so beautifully? Is it because the sap rises up out of the root? And how does the sap make leaves, and blossoms, and branches? And why does it ascend now?

Not so many inquiries at once, Edward; besides, it is much easier to ask questions than to answer them. It would puzzle the wisest man to tell you how the sap forms the leaves, and blossoms, and branches of trees: but if you had thought a little, you would have known that the reviving power of the sun stimulates the sap to rise out of the root at this time of the year. At this delightful season especially, as we look around the works of God, and see them all springing into life and beauty, what reason have we to give utterance

to our feelings, in the words of the enraptured poet,—

“Soft roll your incense, herbs, and fruits, and flow’rs,
In mingled clouds to him; whose sun exalts,
Whose breath perfumes you, and whose pencil paints.
Great source of day! best image here below,
Of thy Creator, ever pouring wide,
From world to world, the vital ocean round,
On nature write with every beam his praise!”



WALK V.

CONTENTS.

EARLY RISING—RULES FOR GAINING HEALTH—GRASS—ITS MANY SPECIES
—SNAILS—LINES OF VINCENT BOURNE—THE NIGHTINGALE—BLOSSOMS
—COWSLIPS—BUTTERCUPS—THE REDSTART—THE LADYBIRD—THE
DRAGON-FLY—THE WHOLE CREATION SUSTAINED BY THE DIVINE
BOUNTY.

THE whole creation is awake, Robert; we will take a walk through the meadows into the wood, before the breakfast is ready.

I am ready, Papa; I know you think that a walk in the morning contributes to health.

Yes, I think if it be not so long as to produce weariness, it is the case. How finely does Milton represent our first parent calling to Eve, when morning “sowed the earth with orient pearl,” advancing from the east with her rosy footsteps. I do not know whether there is anything in our language, more

noble than the Morning Hymn, which you some time since committed to memory, in which he calls on the whole creation to celebrate its glorious Author. That mounting lark reminds me of its close,

* * * * “ Ye birds,
 That singing up to heav'n's gate ascend,
 Bear on your wings, and in your notes his praise.
 Witness if I be silent, morn or even,
 To hill, or valley, fountain or fresh shade,
 Made vocal by my song, and taught his praise.
 Hail, universal Lord! be bounteous still
 To give us only good.”

You said, Papa, in one of our late walks, that half the sick people in the world, if not more, would be cured if they would attend to a few simple rules; and you mentioned going early to rest, and rising early. What else did you refer to?

Frequent exercise in the open air; this gives a full circulation to the blood, and throws the ruddiness of health into the countenance, and through the whole frame. Why has the poor labourer “cheerful days and nights without a groan?” It is because by ac-

tive exercise, he earns his bread before he eats it. The next rule is, temperance in eating and drinking; and, finally, a careful observance of the food which agrees with us. These three rules comprise almost the whole art of preserving life and health. But have you seen no object about which we may converse, Edward?

No, Papa; there is nothing in these meadows but the grass.

Nothing but the grass! Why that is one of the prime blessings which the Creator has conferred on us. It is "smiling nature's universal robe." The eye rests on no object that is more agreeable.

Yes, but you know it is so common. We may see grass everywhere.

Thank God, it is the case; its commonness and abundance render it a very great boon. These meadows furnish a paradise to the cattle, which nourish us daily by their milk and butter; and which finally become meat for our sustenance. We should not overlook any object because it is common. Air and

water are very common, but they are very wonderful articles, and we could not exist without them. Not only the cattle, which are so useful to us, supported by the grass, but countless millions of beings find a habitation, nourishment, and joy in these meadows, and among this grass, which very many like you, Edward, pass over as unworthy of your notice.

I see, Papa, the truth of what you said yesterday, that it is want of thought which makes us look on any of the works of God without interest and admiration.

And all this vast quantity of grass, Edward, has sprung up this spring without the care of its owner. The great Husbandman has bade it appear, and it has heard and obeyed his voice. He said at the beginning, "Let the earth bring forth grass!" and it has done so ever since.

And the colour, Papa, is certainly very delightful.

It is; if the fields had been red or white, they would have dazzled our eyes, and injured the organs of vision; and if they had been black, so far from in-

spiring us with cheerfulness as they now do, they would have filled us with gloom and melancholy. And then, though the robe of nature be of one colour, yet it is composed of so many varied shades, all beautifully mingling together,—

“Shade unperceived, so softening into shade,”—

that there is no dull uniformity, which might have been expected, but a most agreeable, and even delightful variety. All the power and skill of man could not create a blade of grass.

Are there many kinds of grasses, Papa?

Yes; more than three hundred species have been enumerated. They furnish food for almost all creatures. The cattle eat the leaves, and pass by the flower; it is by a kind arrangement of Providence that they do so, that the seed may be preserved. Many of these are food for the birds. Oats, barley, and wheat, are classed among the grasses. The first is the principal food of the horse; the second, you know, provides us with beer and porter; and

the last we see constantly on our tables in the shape of—

Bread, Papa.

Yes; so that we have bread, meat, beer, butter, milk, cheese, leather, wool, and many other valuable articles from our meadows, in which there is nothing but grass, Edward!

Why, Papa, you make everything interesting and important. Did you see that black snail,* in the middle of the path, a little way back; what an ugly creature he is. Have you anything to say about him?

Certainly; there are no animals which do not suggest to us a ground for useful or important remarks. The black snail belongs to the order of vermes molusca. It has no shell, but, in the place of it, a furrowed cloak, almost as thick and as hard as leather, under which, as into a shell, it withdraws its head. There are eight species of the slug, or naked snail.

* *Limax ater*.

But there are many more with shells, some of which are very pretty: I have often picked them up in our garden, and in the copse we have just gone through.

There are very many different species, distinguished by their shells. The greatest part live on land, but many of them in the water. They are used as food in some part of Europe, particularly in Lent. They were a favourite dish among the Romans, who fattened them for their tables. They were very large; an ancient writer informs us, that their shells would hold many quarts.

What snails these must be!

The younger Pliny, in one of his Epistles, tells us, that he and his friends had for their supper a lettuce each, three snails, two eggs, a barley cake, and some few other articles.

I should have ate the lettuce, eggs, and cake, but none of the snails.

Had you lived at that period, most likely you would have done as they did.

The snail has no eyes, Papa.

I think you are mistaken, Edward, though many hold this opinion. It has an eye, it has been commonly supposed, at the end of each horn. The snail is a most singular reptile. It breathes by a hole near the neck. Its entrails are green, branched all over with fine capillary white veins. The mouth resembles that of a hare or rabbit, with four or six needle teeth, like those of a leech, and a horny substance.

They are of no use to us, Papa, but to eat the fruit, and I shall not thank them for that.

Comparatively, it is not much fruit that they spoil. You have observed, that I never gather the apricot, or any fruit which a snail has begun to eat; because they are sure not to touch any more till they have devoured this.

But when they are very numerous, they might eat up all the fruit.

Lime and ashes sprinkled on the ground where they most resort, will drive them away, and destroy the young brood. There is a pretty Latin poem on the

snail by Vincent Bourne; it is admirably translated by Cowper,—

“ To grass, or leaf, or fruit, or wall,
 The snail sticks close, nor fears to fall,
 As if he grew there, house and all,
Together.

Within that house secure he hides,
 When danger imminent betides,
 Of storm or other harm besides—
Of weather.

Give but his horns the slightest touch,
 His self-collecting power is such,
 He shrinks into his house, with much
Displeasure.

Where'er he dwells, he dwells alone,
 Except himself has chattles none,
 Well satisfied to be his own
Whole treasure.

Thus, hermit-like, his life he leads,
 Nor partner of his banquet needs,
 And if he meets one, only feeds
The faster.

Who seek him must be worse than blind,
(He and his house are so combin'd)
If, finding it, he fails to find

Its Master."

Papa, did you hear that torrent of music?

Torrent you may well call it; it is the song of the
Nightingale.*



When I was reading Virgil, we met with a very
sweet passage about her.

I well recollect it; the poet compares the grief of

* *Motacilla luscinia.*

Orpheus for the loss of his wife, to that of a nightingale for the loss of her young,—

“ So, close in poplar shades, her children gone,
The parent Nightingale laments alone ;
Whose nest some prying clown hath found, and thence
By stealth, convey'd th' unfeathered innocence :
But she supplies the night with mournful strains,
And melancholy music fills the plains.”

It is very singular, however, that so few of our classical writers have even referred to this beautiful bird. Neither Homer nor Horace mention her. Pliny* does with much interest; and with a warmth which reminds us of the delightful reference of our Isaac Walton. “He that at midnight,” says Isaac, “when the very labourers sleep securely, should hear, as I have heard, the clear air, the sweet descants, the natural rising and falling, the doubling and the redoubling of her voice, might well be lifted above earth, and say, ‘Lord, what music hast thou provided for

* Lib. x. c. 19.

thy saints in heaven, when thou affordest bad men such music upon earth.' ”

Do nightingales talk, Papa? I read in Goldsmith's *Animated Nature* one day, of two nightingales at an inn, I think, who were talking about the late war in Germany.

'Tis all a fable, Edward; there is no kind of truth in it. Such things are a disgrace to any work on natural history.

The gentleman who dined with us from Edinburgh some time since, said, that there were no nightingales in Scotland, and that he had never heard one sing.

They are found very little farther north than Yorkshire; not at all in North Wales; and, which is still more surprising, they are unknown in the mild counties of Devon and Cornwall.

But what sort of a bird is she, Papa?

A little brown bird, not much unlike a hedge-sparrow, and about the same size. It is met with in Greece, and almost in every part of Europe, and Asia.

The allusions of the Persian poets to the nightingale and the rose are very numerous. But they are not found in America, or in Africa. They come to us about the beginning of April, and leave us early in August.

Well, I thought, from her beautiful song, she must be a very beautiful bird.

It is not the case; and we must be careful not to judge of our fellow-creatures by their outward appearance. Persons who are very ordinary, as to external beauty, are often very estimable for their wisdom and piety.

How I should like to find a nest of the nightingale!

This is rather difficult, as it is always hid in the thick foliage. It is, however, near where the male bird is singing. He sings to cheer the sitting bird; and when the young are hatched, he gives up his singing, and helps to feed them. When they fly away, the hen bird lays again; and he then resumes his song. But let us listen to her; she is singing again. How softly she begins; how plaintive, and, then, how

gay ; how beautifully simple, yet how wild is her warbling ! The whole of her song is varied, sweet, and brilliant.*

Does she sing all night ?

Not all night, perhaps, but a great part of it. She has her name from this circumstance, of filling the gale of the night with her song. Thomson finely bids her, when the other birds have closed their melody,

* * * * * “ Charm

The list’ning shades, and teach the night his praise ! ”

How I should like to see one.

You may sometimes do so ; I have stood very near her, and in sight of her, many times, when she has filled the copse with her music. But she is a shy and

* Tasso prettily says,

Odi quello usignuolo,
 Che va di ramo in ramo,
 Cantando, To arno, To arno !

i. e. Hear that sweet nightingale, who flies from bough to bough, singing I love, I love !

retired bird. Milton notices this in one of the most beautiful of his poems,—

“ Sweet bird, that shun’st the noise of folly,
Most musical, most melancholy ;
Thee, chantress, oft the woods among,
I woo to hear thy evening song ! ”

And Cowper delightfully compares the retired Christian to the nightingale. Referring to the place of his retreat to converse with God, he says,

“ There, like the nightingale, he pours
His solitary lays ;
Nor asks a witness of his song,
Nor thirsts for human praise.”

That orchard, Papa, is quite a garland.

Nightingales and flowers, or beautiful colours and beautiful music, are very naturally connected together. What a display is that orchard of the power and goodness of the Creator ! These trees have all been covered with blossoms within these few days, as if by enchantment. Truly, “ here is the finger of God.”

I think, I like to see the blossoms of the fruit trees, much more than any other flowers ; because one can-

not see the cherry blossom without thinking of the cherries; nor of the peach blossom without thinking of the peach; nor of the apple and pear blossoms, without, in imagination, eating of the fruit.

True, Edward; yet the common flowers are not without their fruit; the fragrance of the sweet rose is its fruit.

Here is a field full of fine cowslips, and shining buttercups.

Botanists place the cowslip under the same class as the primrose; * there are several varieties of them. This is the common, single, yellow cowslip; then there is the double yellow cowslip; the scarlet cowslip, and the hose-in-hose cowslip, one flower growing out of the bosom of another.

I have seen some of the last kind, Papa; they are very pretty. The buttercups, I believe, belong to the class of the *ranunculus*; that in *Polyandria* having

* *Pentandria monogynia*.

many stamens; of the order Polygynia, since it has many pointals.

Of what use are the buttercups?



They adorn our meadows; and most likely they may give food to some of the insect tribes; but I cannot give you particulars.

What a beautiful bird has just flown out of that hollow tree. Did you see him, Papa?

Yes, it was the red-start.* Mr. White observes,

* *Motacilla phœnicurus*; its English name is derived from the Saxon word, *steort*, a tail, and red; the red stort or red tail.

that they often move their tails horizontally, as dogs do when they fawn. Its forehead is white; the crown of the head and part of the neck and back, are a deep blue grey; the breast, rump, and sides, are red; the belly is white; the two middle feathers of the tail are brown, but the rest are red; and the legs are black. It is of the same order as the nightingale. The red-start will readily forsake her eggs if she be disturbed.

Here is as pretty an insect, as the red-start is as a bird, just settled on the sleeve of my coat; it is the ladybird.*

Well, you can tell me where to class this beautiful insect, for its wings are in a sheath.

Is it not in the order coleoptera? which means, that the wings belonging to this class are in a sheath. I have frequently caught them on the rose-tree.

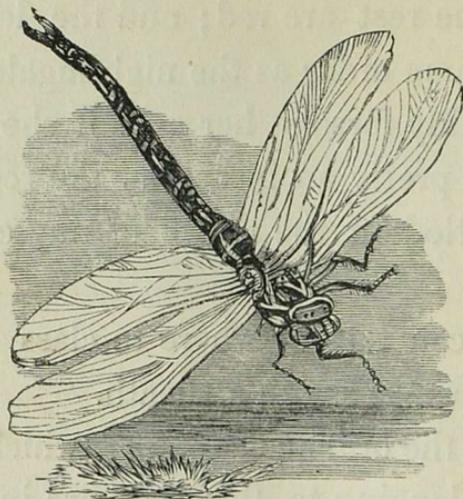
Very likely; they were searching for the aphides, or green plant lice, which are their food. I have seen

* Coccinella.

them sometimes in immense swarms on a summer's day, flying about in the meridian sun.

There, Papa, is an insect as ugly as the other was beautiful.

It is the libella, or dragon-fly. It is, on the whole,



certainly ugly; and most people are afraid of it; but it has no sting, and cannot hurt any one. There are twenty-one species, chiefly distinguished by their colour. They have two large reticulated, or net-work eyes, nearly covering the whole head; they prey on little flies, and move swiftly. Their eyes and wings

are very beautiful objects seen through a microscope. It was lately a water-worm that had six feet. When ready to quit the water, the worm fixes itself on a plant, or bit of dry wood; its skin then dries and splits, and the insect flies into the atmosphere.

How wonderful is the history of insects. I think the dragon-fly went into that sycamore tree. What is he gone thither for?

I do not know. To find food, most likely. But we must not prolong our walk. I fear we shall be rather too late for breakfast. How wonderful is God's care over his creatures! What a large family constantly waits at his table. "He openeth his hand, they are filled with good." All creation "lives, and moves, and has its being in him." He formed, and he sustains all things by the word of his power. The dew at his bidding refreshes the grass, as well as the oak and the cedar; he gives to the bee the sweet honey, and to man his bread, the staff of his life. "All thy works praise thee, O God, but thy saints bless thee. I will praise thee, O my God, whilst I live, I will sing praises to thee whilst I have any being!"

WALK VI.

CONTENTS.

RAIN—RAINY SEASON IN INDIA—THE COCOA-NUT AND TALIPOT TREES
—DANDELION—HEART'S-EASE—GROUND IVY—EYEBRIGHT—THE
DAIRY—LINES ON IT—THE HORSE CHESTNUT—THE CHAFFER—
ELEPHANT BEETLE—THE OAK—LINES OF COWPER.

WHAT heavy showers of rain we had yesterday, and last night, Papa, yet how little appears on the earth.

True; but every thing has drank its fill, and is refreshed. For some days past the grass, the trees, and the corn, seemed languishing and ready to die. We have only to open our eyes, to be convinced that these gracious showers have revived the whole vegetable world.

What a great blessing is rain; if we were to have no rain, how sad it would be!

It would, indeed, Robert; God has only to withhold

rain, and every living thing would die. The world would soon become one vast desert.

Does not rain do good in many ways ?

Certainly ; the great warmth of the sun fills the air with unhealthful vapours ; and the rain purifies and cools the atmosphere. It replenishes our springs, wells, and fountains. It bears down the fine earth from the hills and the mountains, and enriches the vales. Rain is an essential part of the food of the whole vegetable and animal world. Yet too little or too much is equally prejudicial. How ought we to acknowledge the wisdom and goodness of God in the gift of rain in suitable quantities. How dependent are we on him every moment for life, and breath, and all things.

If a farmer had only to water a few fields, he would find it very difficult.

Difficult, Edward ; you should say, impossible. The watering the earth is a display of omnipotence. Yet God does it with infinite ease. He commands his clouds to arise ; and he bids his winds scatter them

over the face of the heavens, till they fall in rain, and refresh the thirsty earth. The Scripture says, that God is "the Father of the rain;" and who but he could create a single drop?

I think the very birds are singing the better for the rain of yesterday.

They are; how, then, ought man to walk,

“ Amid the glad creation, musing praise,
And looking lively gratitude!
And none should silent be whilst Heav'n descends
In universal bounty, shedding herbs,
And fruits, and flowers, on nature's ample lap.
Swift Fancy fir'd, anticipates their growth;
And, while the milky nutriment distils,
Beholds the kindling country colour round.”

In the account you read of Ceylon last evening the writer said, the rainy season had not set in; what did he mean?

Just what he had said. In India they do not have now and then a rainy day or night, as we do; but the rain falls for several months together. It begins to rain about the same time every year. “The approach

of the rainy season," says one who lived in India, "is generally announced by vast masses of clouds that rise from the Indian ocean, and advance towards the north-east, gathering and thickening as they come near the land. After some threatening days, the sky assumes a troubled appearance in the evening, and the monsoon generally sets in during the night. It is attended by thunder storms far exceeding those in more temperate regions. It generally begins with violent blasts of wind, which are succeeded by floods of rain. For some hours, lightning is seen almost without intermission; sometimes it only illuminates the sky, and shows the clouds near the horizon; at others, it discovers the distant hills, and again leaves all in darkness; when, in an instant, it re-appears, in vivid successive flashes, and exhibits the nearest objects in all the brightness of day. During all this time, thunder never ceases to roll; and is only silenced by some nearer peal, which bursts on the ear with such a sudden and tremendous crash, as can scarcely fail to strike the most insensible heart with awe.

At length, the thunder ceases, and nothing is heard but the continued pouring of the rain, and the rushing of the rising streams. The next day presents a gloomy spectacle; the rain still descends in torrents, and scarcely allows a view of the blackened fields; the rivers are swollen and discoloured, and sweep down along with them the hedge, the huts, and the remains of the cultivation which was carried on during the last dry seasons in their beds."

I should rather live, then, in England than in Ceylon. The rainy period of the year must be very dark and dreary.

It has been often observed, that there are advantages and disadvantages in every climate; and we should balance the one against the other. It has been said, that the people of Ceylon, among other compensations for their disadvantages, are endowed with two vegetable blessings, the cocoa-nut, and the talipot tree. The latter affords a prodigious leaf, impenetrable to sun or rain, and large enough to shelter ten men! It is a natural umbrella; and is of as eminent service in

that country, as a great-coat tree would be in this. A leaf of the talipot tree is a tent to the soldiers, a parasol to the travellers, and a book to the scholar; for all books in Ceylon are written on it. The coconut tree affords bread, milk, oil, wine, spirits, vinegar, yeast, sugar, cloth, paper, huts, and ships!

What trees these are!

They are, indeed, very wonderful productions. But now, Edward, you shall go and collect what you think worth notice, whilst I read a little beneath the shade of this oak.

* * * * *

Well, Edward, what have you in your handkerchief?

Ever so many things; dandelion, heart's-ease, ground ivy, eye-bright, daisy, and a flower of the horse chestnut. I have also caught a fine chaffer. And I will thank you to tell me all about them.

Well, let me have one at a time, and I will tell you somewhat about them. I fear I cannot tell you their whole history. Surely, you have not forgotten St. Pierre's strawberry plant.

No, Papa ; please to examine the dandelion.

You may see, at a glance, that it belongs to the syngenesia class. This class comprehends all the compound flowers. Dandelion, or leontodon, belongs to the first order, or Polygamia equalis ; the florets all of both sexes. The plants of this class are usually bitter ; thistles, lettuce, coltsfoot, groundsel, the daisy, marigold, camomile, and cotton, belong to it. There are nine species of the dandelion ; this is the finest of them. Whilst the



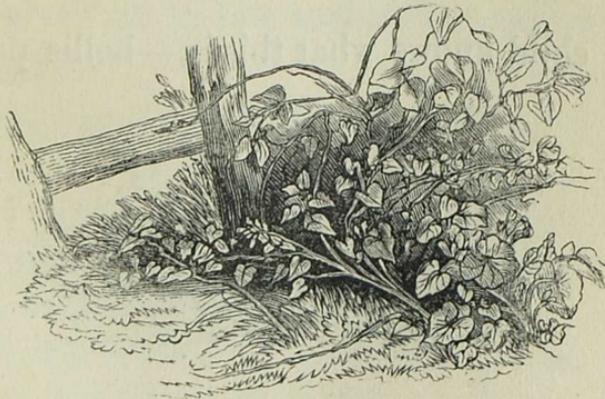
leaves are young, they are often ate in salad. The French eat both the root and leaves with bread and butter. Goats will eat it ; and swine, very greedily. And some of the little birds are fond of its seeds.

This is *viola tricolour*, or heart's-ease. It is an elegant little flower, belonging to the class syngenesia, to which I have just referred. It is described by bo-

tanists as having three faces under a hood. It has no fragrance; but its colours, as you see, are purple, yellow, and light blue. It begins to flower at the commencement of the summer, and continues shooting and flowering till winter; and oftentimes in the winter, if it be mild.—Well, what else have you?



Here is ground ivy, Papa; the flower is very pretty, as seen through my glass.



It is; the botanic name is *glecoma hederacea*. It belongs to the *Didynamia* class, which has two stamens

long, and two short. See, here they are. There are two orders; the first is gymnospermia, or those that have naked seeds; the other is angiospermia, or those that have seeds covered. Ground ivy is of the first order. Mint, thyme, baum, and the fox-glove, are of this class.

I see the next gift you have for me, is euphrasia, or eye-bright; it is a beautiful little flower. This belongs to the same class as the ground ivy, only it is of the second order, and the seeds are covered. It was used by medical men for disorders in the eyes, many years since; I do not know that it is now thought of any value.

Every child knows what this is,—*bellis perennis*, or



the common daisy. It is of the class syngenesia, the same as the dandelion, but of the second order, poly-

gamia superflua, having the florets of circumference female, like the groundsel. You have also, I see, the bellis major, or, the greater daisy, or corn-marigold, as some call it. This belongs to the same class and order. There are several species of them: some are cultivated in our gardens, and are very pretty.

Few, if any of the field flowers, are more beautiful than this pretty daisy, tipped with red.

Beautifully indeed, tipped with red. Hence it has often been noticed with much elegance by our poets. Cowley calls it "the star of the earth." Dr. Mason Good has given us a few instructive verses on this little monitor;—

“ Not worlds on worlds in phalanx deep,
Need we to prove a God is here ;
The daisy, fresh from winter’s sleep,
Tells of his hand in lines as clear.

For who but he who arch’d the skies,
And pour’d the day-spring’s living flood,
Wondrous alike in all he tries,
Could rear the daisy’s purple bud ;

And so on ; I can't repeat the whole. You shall read it to me when we get home. Well, we have almost got through your collection, Edward. Here is the *hippocastanum escular*, or the horse-chestnut. It has seven stamens ; and so it belongs to Heptandria, the seventh class. There is but one pointal, and but one order in this class ; it must, of course, be monogynia. This tree makes a noble appearance in the Spring, the branches being terminated by fine spikes of flowers spotted with the colours of the rose ; the whole tree seems covered with them. The trees grow quickly ; in a few years it affords a good shade in summer. But the leaves fall about the end of July, and the wood is of no value. Deer are fond of the nuts, but no other animals. They grow very abundantly on Mount Etna, in Sicily. There is one very much famed on its summit, called the chestnut tree for a hundred horse, because it is supposed that so many could take shelter under it. Some have affirmed that it is one hundred and sixty feet in circumference. It is hollow, but this does not affect its verdure ; since the chestnut, like the

willow, depends not on the body of the tree, but on the bark. A habitation has been formed in the hollow of this tree; and, what is more remarkable, an oven, for drying nuts, almonds, and chestnuts.

But see, Edward, your chaffer is moving, and spreading his wings; he is not satisfied with his quarters, and is meditating his departure. It is a wonderful insect. There,—his wings are unsheathed,—he is gone. And let him go. In the open common of nature, we should not hurt the meanest insect. The great Parent of good has formed a dwelling-place, amply sufficient for all his creatures. If any of the inferior animals molest, or injure us, we may remove, or destroy them. Their rights are to give place to ours: but we are not wantonly to kill anything.

And the poor cockchaffer, Papa, has plenty of enemies. What multitudes the boys, who come from the neighbouring town, kill, every season. I met a man, you know, last year, who had a basket full; and he said they were for his pigs. And I have seen the sparrows and other birds catch them. Our cat was

eating one in the stone court last week. And I saw the fowls in the poultry-yard running after one yesterday.

Very likely; they have, as you said, plenty of enemies. Before they gain their full wings, when in their grub, and caterpillar state, crows, rooks, and other birds, follow the plow, and devour immense numbers of them. The very dogs eat them in this state. And it is well that they are thus destroyed, or they would do irreparable mischief. I have seen many acres of grass cut off, withered as if burnt up by lightning, from the root having been devoured by the grubs of the chaffer. And you have repeatedly seen how they devour the leaves of the plantation. I have known a large wood of oaks nearly stripped bare by them. It is well that they do not abound more than once in three or four years. Naturalists call it the *scarabæus melolontha*. And I am sure you can tell to what order it belongs.

Yes, you observed that it was unsheathing its wings: it must belong to *coleoptora*, which means having

wings in a sheath. I think you said that it lay in the ground, and went through various changes, till the fourth year, and that then the perfect chaffer crept out of the earth.

Yes; their strength is prodigious for their size. Bulk for bulk, they are six times stronger than a horse; and a thousand times stronger than a man. But this insect is small in comparison with the elephant beetle of South America, which is of the same order, and as large as a man's fist.

I am glad these enormous insects are not to be found in Britain.

It is well they are not. But whilst we have been looking abroad for objects to observe, here is one of the most important which the Creator has given us, under whose shade we are sitting.

What! this oak, Papa?

Yes, this oak. It is a very fine tree. I should suppose not less than one hundred years old. The flower has eight stamens, and belongs of course to the * * *

Eighth Class, Papa; or Octandria and it has four pointals, and must be of the tetragynia order.

You are right, Edward. The Cowthorp Oak, mentioned by Dr. Hunter, the Editor of Evelyn's Sylva, was of an immense size. Within three feet of the ground it measured sixteen yards round; and close to the ground it was twenty-six yards. When in its prime, it must have been a surprisingly fine tree. The poplar, the hazel, mazerion, and the heaths, are of the same class.

And it is one of our most useful trees; for they build the ships of oak, don't they?

Yes, Edward; and it is used in many other ways. The bark is employed to tan hides, and make leather.

But how does it do this?

It has a quality of binding the parts of the hide more closely together, and so stiffens it, and makes it fit for shoes, and other purposes.

And then there are the acorns which the pigs eat.

The floors and staircases of our houses are usually of oak. Tables, and many articles of furniture, are

made out of it. Lord Dudley has an oak table, made from a tree that grew in his park, which is three feet broad, and seventy-five feet long.

What a tree it must have been, Papa!

Its bark is not only used in tanning, but also in dying black; especially is this the case with the oak apples which you have often gathered.

And I think you said, that these were used in making ink.

They are a principal ingredient. When I was visiting in the neighbourhood of Olney, in Buckinghamshire, where the poet Cowper lived, I went into Yardley Forest, and climbed the tree which he has so beautifully celebrated.

You climb an oak tree, Papa! Why I never saw you get up a tree; and you could not get into this oak.

Perhaps not; but I did really climb to the uppermost branches of the Yardley Oak; it is full of great knots, and I had no more difficulty in climbing it, than I have in going up stairs.

And how long did you stay in it?

For some time, I assure you, for the delight of contemplating the surrounding scenery, lulled my thoughts into a most delightful reverie. As I beheld the vast throne on which I was seated, and examined its infinitely varied twistings, furrows, and irregularities, I was led to compare the life of man with the duration and growth of this majestic monarch of the woods. This oak, I reflected, requires even the aid of pleasing, but uncertain tradition, to hand down to us the record of its first origin: it has stood while the infant has become an old man—it has been cotemporary with generation after generation—while man, the vaunted “lord of the creation,” is but an ephemeral being—a mere existence, that is here to-day and gone to-morrow—presenting a most forcible admonition of the great importance of constant preparation for that future and better state, in which we shall change places; and the duration of the oak compared with our own existence, will be but the atom of a day—eternity against time—in which the revolution of

days, weeks, months, years, and even periods, will leave no evidence of their progression.



S U M M E R.

S U M M E R.

W A L K VII.

CONTENTS.

WONDERS OF VISION—POTATOES—THE HEDGE-SPARROW—INSTINCT—
NESTS OF BIRDS—WOODBINES—HONEY DEW—THE DEW—GRASS-
HOPPERS—THE HOUSE-CRICKET—THE MOLE—CRICKET—LOCUSTS—
THE GLOW-WORM—LINES ON, BY V. BOURNE AND DR. WALCOT.

I HAVE been thinking, Papa, of the wonders of sight.

You may well, indeed, say wonders of vision; I scarcely know anything more astonishing. The eye is the source of innumerable enjoyments. “For to that system of means,” says Dr. Chalmers, “which has been formed for the object of seeing, there enter

at least twenty separate contingencies; the absence of any one of which would derange or destroy the functions of the eye." Objects become visible to us by the rays of light coming from them, and painting their likeness on the retina. From this eminence we can see several miles; and how many objects there are in the landscape!

Yes, there are cottages, gardens, orchards, fields, corn, grass, cattle, and sheep, at least; and yonder is a waggon heavily laden, passing along the road.

Well, all this prospect, and these objects, are drawn with exactness, and inimitable skill, on the retina, at the bottom of the eye; on a space of not more than half an inch in diameter!

How wonderful; but how is it?

It cannot be altogether explained. There is a faculty without which we could not see, even with our eyes; it is the mind that perceives. You cannot see the magnificent rings around the planet Saturn; but I showed them to you the other evening through my telescope. The telescope did not see the planet;

it was only the medium, or instrument, by which your mind saw it; and the eye is the same.

How very small every thing must be drawn at the bottom of the eye; and yet the hills appear very large, and every thing according to its real size. And how is it, that, as all these things are so close together on the retina, that there is no confusion, but we see every individual thing so plainly? And how, * * *

Indeed, Robert, that *how* is a puzzling word; don't let me have any more at present; for I really know not what to do with them. I do not undertake to explain all the wonders of vision; but, if you will have patience till you get home, I will explain the subject further, by the aid of some excellent drawings which I have of the different parts of the eye. Let us find some subject of conversation which is more within our reach.

What shall it be, Papa? There is a field of potatoes.

A very good subject; approaching in importance to wheat-fields; since they afford a large portion of

sustenance to the people of England, and a much greater to those of Ireland.

I think you said they were brought to Britain at first from America, where they grow naturally; but they were not used there for food, at first.

It is a native of America; though but one sort were brought over, we have now very many kinds. There are the pink eyes, prince's beauty, red, black, rough, and horse's leg kinds.

What fine and strange names for potatoes!

They are. A German botanist in 1588, first gave a picture of them, as a rare plant. Some roots were received from Virginia, and planted in a garden in the neighbourhood of London, in 1597. Sir Francis Bacon, in his *History of Life and Death*, says, "If ale were brewed with one-fourth part of some fat root, such as the potado, to three-fourths of grain, it would be more conducive to long life than grain alone." At first they were eaten with a sauce made with wine and sugar!

With wine and sugar, Papa!

Yes; and it is not a hundred years since they were looked on as a coarse root, fit only for the poor. Their increase where properly managed, is wonderful. I have read of a single potatoe cut into nine pieces, and planted in a drill, which produced more than five hundred good-sized ones, and weighed more than eight stone. The philanthropist, Howard, informs us, that from each cutting, of a particular kind, he had from twenty-six to twenty-seven pounds and a half produce; and by careful arrangement, he says, this potatoe increased "full four hundred fold." It is now to us an inestimable root.—But, Edward, go and look in that bush; I saw a little bird fly out of it; I think her nest is there.

* * * * *

Yes, here it is; it has four little blue eggs in it.

It is the hedge-sparrow's,—*motacilla modularis*,—this is one of the little birds which stay with us all the year. Unlike most others, they live in pairs. This small brown bird is one of the first that builds a nest in the spring. This nest must be for a second brood.

All the hedge-sparrows build the same sort of nest, don't they? How is it that they do so?

I know not, Edward. The common reply to your question is, by instinct.

But what is instinct?

“A certain power or disposition, by which, independent of all instruction or experience, without deliberation, and without having any end in view, animals are unerringly directed to do, spontaneously, whatever is necessary for the preservation of the individual, or the continuation of the kind.” It has been defined in other words, which I like rather better, “A determination given by Almighty wisdom to the mind of an animal to act in a particular way, upon various occasions, without intelligence, or knowledge of good or ill, and without knowing for what end or purpose he acts.” Did you observe the poor woman sitting on the style which we came by just now, with her baby at her bosom?

Yes.

That was instinct; the infant knows not the food

is necessary to the preservation of life, nor does he take it with this design.

Still I don't know *how* this is: and *how* the same kind of birds who have never seen one another, and who live in different countries, should nevertheless build the same sized nest, and of the same materials.

Nor can I explain it farther to you, Edward. Instinct, like many other terms that are current, is a word often used to conceal our ignorance.

What a great difference there is in the nests of birds; the rook makes his nest of small sticks; it is very unlike this hedge-sparrow's.

But the rook lines it with dead grass, or hay, or something soft. The wood-pigeon's nest is composed entirely of bits of twig, without any lining whatever, and she lays only two small white eggs.

What a difference there is between the martin's nest, and that of a chaffinch, or goldfinch.

There is; and the ostrich you saw in the Zoological gardens, does not make any nest.

Where then does she lay her eggs?

In the warm sand of the countries where she lives, and takes no more care of them. Nor is there any need; the warmth of the climate hatches them, and the little ones can take care of themselves.

In what different places too, the birds build. Who shows them which is the most proper? And how do they know that sitting on their eggs will hatch them? Or that they shall have young ones?

I am not sufficiently wise, Edward, to answer your questions. It would not be difficult to ask similar ones for a whole day; and no person could give a satisfactory reply.

How sweet those woodbines smell, which run up this beech; will you stay whilst I gather some?

* * * *

They are very fragrant. How kind has God been to gratify all our senses! It is, I see, of the same class with the primrose and the cowslip.

That is Pentandria; then it has five stamens,—and here they are. Here is one pointal; it is the first order; or monogynia.

It is. I think, Edward, you improve in your knowledge of botany. It is called *lomocera periclymenum*. The flower is in one piece, or monopetalous; which signifies the same thing. There are many varieties of the honey-suckle.

Did you observe, Papa, that there is something on the leaves like sugared water; what is it?

It is the honey dew.

And does it come from the flower? No; you see it is on the leaves of several trees around you. It is the product of the aphis, or the green blight, as they are called. It stops the pores of leaves, and is said to be injurious to plants.

I have seen it on the leaves of the rose trees in our garden.

The bees and the ants are fond of it, and they gather it up very carefully. It is very different from the usual dews of the evening. These have no sweetness; they are a pure water which arise out of the earth, and refresh the whole of the vegetable creation.

But does not the dew fall, Papa?

There is, no doubt, a moisture which occasionally falls upon the fields; but it is more correct to say, that the dew rises. A glass put over a plant, so as to exclude the air, will convince any one of this. Without the dew in the hot season of the year, every green shrub, or tree, and field, would wither and die. What different methods the great Creator has employed to water the earth! So that even in countries where there is no rain, the productions of the earth are very abundant.

But how can things be watered without rain?

There is no rain in Egypt; but the Nile annually overflows the country, and it becomes very fruitful. God has very many ways of accomplishing the same beneficent end.—But, hark, Edward, how merrily the grasshoppers are singing; the air is very warm and dry; and just what they like. They belong to the class Hemiptera, or half-winged insects. There are many species of them in our own and foreign countries. Naturalists call those we now hear the *Gryllus campestris*, or the field grasshopper, or cricket. Mr.

White has given a pretty full account of it. In digging, he caught one which was so bruised with the spade, that he took from it a multitude of eggs; they were long and narrow, of a yellow colour, and covered with a tough skin. By this circumstance he learned the difference between the male and the female. The male he found was of a shining black, with a golden stripe across his shoulders. Their song is produced by a brisk friction of one wing against the other. They generally dwell alone.

I much like to hear their song, Papa.

It is generally regarded as pleasant. "When the males meet," Mr. White says, "they will fight fiercely, as I found by some which I put into the crevices of a dry stone wall. The first that got possession of the chinks, would seize on any intruder with a vast row of serrated, or saw-like fangs. With their strong jaws, toothed like the shears of a lobster's claws, they dig their curious regular cells. When taken in hand, I could not but wonder that they never offered to defend themselves, though armed with such formidable wea-

pons. They seldom stir in the day-time more than two or three inches from home; but they chirp night and day, with little interruption, from the midst of May to the middle of July. One of these grasshoppers, when confined in a paper cage, set in the sun, and supplied with plants moistened with water, will feed and thrive and become so merry, and loud, as to excite a wish to hang him out in the open air. If the plants are not wetted it will die.

You said, that the house-cricket* was of the same class as the large grasshopper you have noticed; and our servant says, that it eats bread.

I am not sure of this. It will devour woollen stuffs and stockings, if they are damp. "As one should suppose," says Mr. White, "from the burning atmosphere which they inhabit, they are a thirsty race, and show a great propensity for liquids, being found frequently drowned in pans of water, or milk, or broth. They will eat almost any thing. Their shrill noise

* *Gryllus domesticus*.

is occasioned by the brisk attrition, or rubbing of their wings. They may be destroyed, when troublesome, like wasps, by vials, half filled with beer, or any liquid, set in their haunts, for, being eager to drink, they will crowd in till the bottle is full."

Some people are pleased with them, and would not have them destroyed, Papa; our dairyman said, it was not lucky to kill them.

People of a higher rank in life than the dairyman have been pleased with their song. No doubt he was who wrote the pretty lines,

“Little inmate, full of mirth,
Chirping on my kitchen hearth,
Wheresoe'er be thine abode,
Always harbinger of good;
Pay me for thy warm retreat,
With a song more soft and sweet;
In return thou shalt receive
Such a strain as I can give.

Tho' in voice and shape they be,
Form'd as if akin to thee,
Thou surpassest, happier far,
Happiest grasshoppers that are :

Theirs is but a summer's song,
Thine endures the winter long ;
Unimpaired, and shrill, and clear,
Melody thro' all the year."

Harmless as they appear to be, Capt. Brown remarks, that they fight with each other desperately. "We have frequently," says he, "captured them, and, putting them in a tumbler covered with paper, have seen their battles. On more than one occasion, they have ate each other. On examining a tumbler in which the preceding evening we had left three, and some bits of bread, two had been devoured, except three of the limbs, and the antennæ. In return for his misdeeds, I terminated the existence of this insect cannibal, and placed him in my cabinet."

That served him right. What was that the man brought you, and called a locust?

That was a mole cricket.* It has a formidable pair of front claws, and may not be much unlike a locust.

* *Gryllotalpa vulgaris*.

They excavate a dwelling in the earth, and lay about a hundred eggs; and often do considerable damage to the flower garden. These, as well as the locust, are of the same order. But I will lend you some travels in South America, which will inform you how the flights of locusts sometimes intercept the beams of the sun, and render the day gloomy; whilst they destroy every thing green for many miles together, and sometimes through a province, or kingdom.

How dreadful that must be!

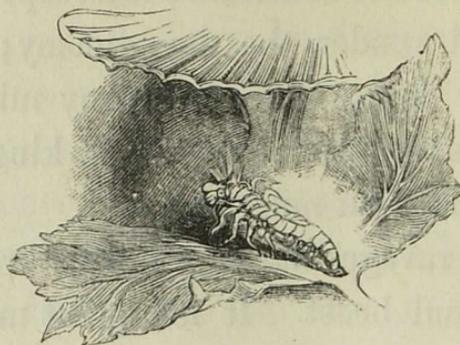
It is: their ravages have sometimes brought famine both to man and beast. It is a great mercy they do not visit our land.—But see, how the elder-tree is loaded with blossom; get me a bit of one of the bunches, Edward.

Here it is, Papa; and I see it has five stamens, and must be of the class Pentandria; and there are three pointals, so it must be of the third order, or trigynia.

You are right, Edward. The learned name it bears, is Sambucus. It is much used among the poor for making cooling ointments; and its berry produces

an excellent wine. The flower, seen through my glass, is very pretty and delicate. But there, I see on that bank a light which admonishes us to direct our footsteps homewards.

It is only a glow-worm, Papa.



True, it is only a glow-worm; but yet a most wonderful insect. Have you not read about it?

Not particularly; only, I have learnt some verses, which I think I can repeat, about it.

Repeat them,—

“Beneath the hedge, or near the stream,
A worm is known to stray;
That shows by night a lucid beam,
Which disappears by day.

Disputes have been, and still prevail,
From whence his rays proceed ;
Some give that honour to his tail,
And others to his head.

But this is sure,—the hand of might
That kindles up the skies,
Gives him a modicum of light,
Proportion'd to his size.

Perhaps indulgent nature meant,
By such a lamp bestow'd,
To bid the traveller, as he went,
Be careful where he trode.

Whate'er she meant, this truth divine
Is legible and plain,
'Tis power almighty bids him shine,
Nor bids him shine in vain.

Ye proud and wealthy, let this theme
Teach humble thoughts to you ;
Since such a reptile has its gem,
And boasts its splendour too."

They are pretty lines, Edward. I recollect them ; they are a translation, by Cowper, from the Latin verses of Vincent Bourne.

The glow-worm is of the order coleoptera; the

female has no wings,—but the male has, and they are in a sheath. It has a hood over its eyes, that its vision may be directed downwards, to find its mate. The male glow-worm, contrary to what has been supposed, gives a light, though it is but faint. They can put out their light when they please: “it proceeds from brilliant spots on the three last rings of the body, and on the tail; the luminous matter is a yellow substance contained in the vesicles; and when these vesicles are moved entire, they shine for some time afterwards; but if wounded, they are extinguished.”* Linnæus calls this remarkable insect, *lampyris nocturna*; or, the nocturnal fire-fly.

But it is not a worm, Papa.

It is not. The body has ten joints, or divisions. The upper part of it is of dark brown; beneath, it is slightly tinged with rose colour.

Is there no other insect that gives light?

Not in our own country, I think. There are, how-

* Capt. Brown.

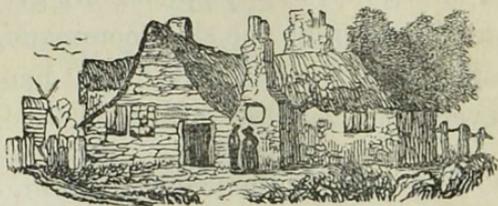
ever, many remarkable fire-flies in several parts of the globe. The elater noctilucus, in South America, is one of them. Three or four put into a vial will give a light as good as a common candle. The fulgora lanternaria, or lantern fly of Peru, is another; this is a large insect; it is said to be six inches long; and travellers by placing several of them on a branch have often found the road by their light, through the woods. But fire-flies in some parts are innumerable. Let me repay you for your fine verses on the glow-worm, by some beautiful lines on the same subject;

“ Bright stranger, welcome to my field,
 Here feed in safety,—here thy radiance yield;
 To me, O nightly, be thy splendours giv’n;
 O could a wish of mine the skies command,
 How would I gem the leaf with liberal hand,
 With every sweetest dew of heav’n.

O may no feather’d foe disturb thy power,
 And with barbarian beak thy life devour;
 O may no ruthless torrent of the sky,
 O’erwhelming force thee from thy dewy seat;
 Nor tempest tear thee from thy green retreat,
 To bid thee ’midst the humming myriads die!

Queen of the insect world ! what leaves delight ;
Of such these willing hands a bower shall form,
To guard thee from the rushing rains of night,
And hide thee from the wild-wing of the storm.
Sweet child of stillness ! 'mid the awful calm
Of pausing nature, thou art pleas'd to dwell,
In happy silence, to enjoy the balm,
And shed thro' life, a lustre round thy cell !

How different man, the imp of noise and strife,
Who courts the storm that tears and darkens life,
Blest when the passions wild his soul invade !
How nobler far, to bid the whirlwind cease,
To taste, like thee, the luxury of peace,
And shine in solitude and shade !”



WALK VIII.

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THE HAY-FIELD—MORAL INSTRUCTIONS—FOXGLOVE—THE DOG-ROSE—
DIVERSITY OF FLOWERS AND ANIMALS—ROOKS—LANGUAGE OF ANI-
MALS—DIFFERENCE BETWEEN ROOKS AND CROWS—THE JAY—THE
AMERICAN SPECIES—THE RED-LEGGED CROW—CUCKOO SPIT—THE
LIME TREES—BEES—SOUNDS.

How deliciously, Edward, the hay smells in this field. See it is quite dry, and in fine order to put together in the rick.

Yonder are the waggons just coming into the field. What a fine feast it will be for the horses, cows, and sheep, when they can get nothing abroad in the winter.

It will. How bountifully does God provide for all his creatures, and with infinite ease. It is a sublime expression of Holy Writ,—“He openeth his hand, and supplieth the want of every living thing.” None

but he who made them all, could provide for them. I scarcely know a more instructive spectacle, than a field of grass which has fallen beneath the scythe of



the mower. How forcibly am I reminded of the command of God to the Prophet,—when he asked him, “What he should cry? Cry,” said he, “All flesh is as grass, and all the goodliness of man as the flower of grass.” And the comparison is very striking and instructive. We spring from the dust, like the grass, and in a few years we return to the dust. How many

of our race, as the tender blade, are cropped in their infancy. These, no doubt, are happy. And their state is far more desirable than that of those who attain length of days only to offend their Creator, and to die in their sins.

Dear brother William, Papa!

Yes, he had nearly reached maturity; like the beautiful product of the field, admired by every eye. Little did we imagine, that at the moment when all were ready to congratulate him on his health, strength, and loveliness, that Death was just at the door with his fatal scythe, demanding entrance,—a demand not to be resisted,—to cut him down, and convey him to the tomb. Nor was his case singular; it is that of multitudes of our race,—

“How often have we seen them fall at once,
Our morning’s envy, and our evening’s sigh!”

But, Papa, God bade the Prophet compare all “the goodness of man,” to the flower of the grass.

He did so. And this is as if he had said, Should the gay, the affluent, and the splendid of human kind

regard the grass as too homely a comparison, let them recollect, that with all their shining qualities, and possessions, they are but as "the flower of the grass." This is the case, though they may be "clothed in purple and fine linen, and fare sumptuously every day."

Another sacred writer compares man to "the flower of the field." Not to that of the garden, which is carefully protected and sheltered; but to that which may be cropped or trod on by the cattle, or gathered by the hand of any one who is passing by. Well, therefore, might Moses breathe the prayer, "O that they were wise, that they understood this, that they would consider their latter end!"

What is it to be wise, and to consider our latter end?

I think, Edward, as you daily hear the Scriptures read in our family, and are favoured with the best instructions both at home, and in the sanctuary, if you were to think a little, you could answer your own question.

Is it to pray to God?

Certainly, he is not wise, who has not begun to ask God to bestow on him this infinite good, even his favour.

Is it to live mindful of eternity, and to pray that it may be happy to us?

It is; in a word, it is to repent of our sins, and to trust alone in his merits who came to seek and to save the lost. He who knows that he is, ere long, and, perhaps, at a moment's warning, to quit his present habitation, is not wise, who is not looking out for another. Nor is he wise, who, knowing that he must shortly quit the present scene to return to it no more, who rests satisfied, till he can say, on good ground, with the primitive Christians, "We know that though this earthly house of our tabernacle be dissolved, we have a building of God, a house not made with hands, eternal in the heavens." But let us, for the present, Edward, dismiss this important and affecting topic.

What, then, shall we talk about? This fine bell-flower?

Yes, if you please. It is the *digitalis purpurea*; one of the most beautiful of our field flowers; and though a deadly poison, it is used in medicine as a remedy for various disorders.

In what disorder, Papa?

In the dropsy, I believe; and some years since it was employed, by way of experiment, in consumptive cases; but, I apprehend, with no real benefit. It is violent in its operation; and should be used with great caution.

It has two stamens long, and two short; and must be of the class *Didynamia*, to which ground ivy, thyme, and mint belong.

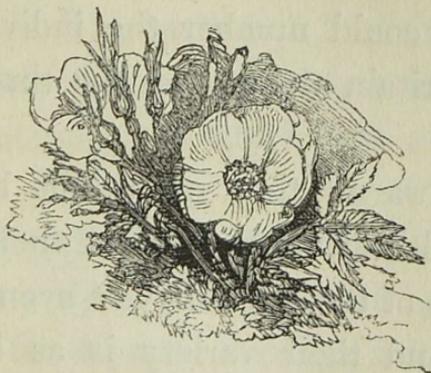
But what order is it?

There are but two in this class; the first is *Gymnospermia*, or those plants whose seeds are exposed and bare, as marjoram. The second order is, *Angiospermia*, whose seeds are covered, like those of the fox-glove.

But why do you not distinguish the orders of this class, as you do the others, by the number of pointals?

We cannot do so; because the plants which belong to it have but one pointal.

True, Edward. And you had better throw the flowers away. Beautiful as they are, I am of opinion that the smell of them is injurious. Here is an article, whose fragrance you may enjoy as long as you please; and it is in its prime, and very sweet.



This is the dog-rose; I know the botanical place of these at a glance. It belongs to the class Icosandria, which has always more than nineteen stamens, and they stand on the cup of the flower. And here, there are many pointals; so it must be of the Poly-

ginia, which word means many pointals. The strawberry belongs to the same class.

It does. Scarcely any one would believe that there is only one kind of rose, which is the *rosa canina*, or the dog-rose, you hold in your hand; and that all the fine roses in our garden have been derived from it; but this is really the case. This was the opinion of Linnæus.

Who, Papa, could number the individual flowers, which Great Britain alone produces through the four seasons?

No one, Edward; they could not be numbered. There are multitudes which from their size escape the observation of the human eye; even these are innumerable. And their variety is as surprising as their number. And not only are they different in their several classes, but also in the same species; we have not only pinks, carnations, stocks, and tulips, but a variety of these very flowers. And how are they diversified as to their stem, leaves, and fragrance. How delightfully do they succeed each other; so that

there is no period of the year without some of these most lovely displays of the divine power, wisdom, and goodness.

And how great is the difference between the shrubs and trees; between the sensitive plant and the oak; between the bramble and the vine!

Yes, we have reason indeed to exclaim, "O Lord, how manifold are thy works! In wisdom hast thou made them all! The earth is full of thy riches!"

And between the ostrich and eagle, and the wren and little humming bird which was sent from South America.

Truly so; but the displays of the divine wisdom and goodness are without bounds.—We might watch this rookery here for days, to the high gratification of our curiosity. Hark, how they are all talking together.

Talking, Papa! do rooks talk?

I think it is evident that most creatures understand each other; you may call it talking or what you please.

I have seen a large company of rooks in a field, whilst one has been in a lofty tree as a sentinel;

when he has given the alarm, they have all fled away in an opposite direction to the approaching enemy. How is this, if they do not understand his communication?

It looks as if they did. Don't they do much good by destroying the grubs of insects?

There can be no doubt of it, Edward. They follow the plow with much industry. They have been observed to notice plantain withered by the root having been destroyed by grubs; and, pulling up the plant, they have devoured the depredator.

How is it that they come back every year, and build in the same trees?

I know not, Edward; they seem pleased to do so. It is impossible fully to account for all the habits of birds and animals. They have built in these trees ever since I was a boy.

What a multitude there must be now: there could be only a few then, Papa.

I think they are much increased; still, not so greatly as you would imagine. Many of them are killed every

autumn and winter. Mr. Jesse says, that the rooks' nests in four successive years in the avenue of Hampton-court Park, were about seven hundred and fifty. "Allowing," says he, "three young birds, and a pair of old ones, to each nest, the number would amount to three thousand seven hundred and fifty." The increase here must have been prodigious. This gentleman mentions a curious fact, of which I have been an eye-witness; "They are very particular," says he, "that none of their society build away from the usual line of trees. A pair of rooks did so in the spring of 1832; and when their nest was nearly finished, at least fifty others came, and demolished it in a few minutes."

Do look up now, Papa; see how they are quarrelling.

They are very prone to quarrel; and like young people, and persons of large growth, often about mere trifles, a stick, or a straw.

But do they do no harm, Papa?

No doubt, they do; when the wheat is just springing up, unless they are watched and disturbed, they

will pull up and devour very much of it. In the time of Henry VIII. an act of parliament was past to destroy rooks and crows; every hamlet was to provide nets for ten years. And the inhabitants were to meet at certain times in the year to consider how they might best destroy them.

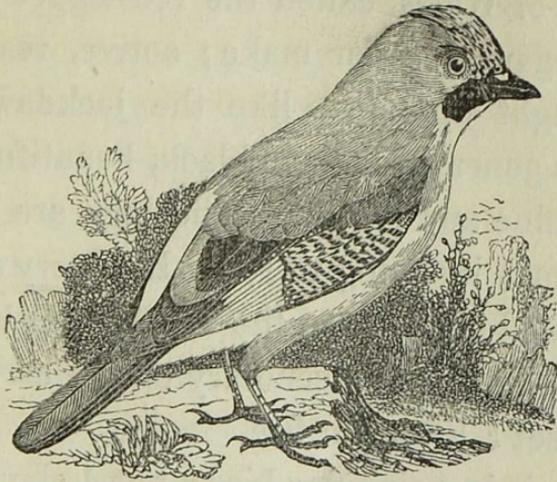
How do rooks differ from crows?

The principal difference is in the nostrils, and root of the bill; these, in the crow are covered with feathers; but in the rook are bare, or covered only with a few bristly hairs. This arises from its thrusting its bill into the earth after worms and insects; whilst the crow feeds upon carrion. It is very singular, and not to be accounted for, that the rook should be with us both summer and winter; whilst in France, and other countries, they are birds of passage.

Is not the jackdaw in our garden of the same order with the rook?

It is,—both are of the order of the *Picæ*; and so is the Jay, one of the most beautiful of our birds, as to its plumage. Its forehead is white, streaked with

black; it has long feathers on its head, which it can raise, as it pleases, into the form of a crest. The whole neck, back, breast, and belly, are of a faint purple, dashed with grey. Many of the feathers are of a light bay; and the larger ones are beautifully barred with a lively blue, black, and white.



How I should like to see one.

They are not very numerous, and are shy birds; keeping generally in thick woods and copses. There is a smaller one in America, called the blue Jay. These are often seen in large flocks. Eighteen or

twenty thousand have been known to alight on a field at once, and lay the whole waste in a little time, if not disturbed. They are the most destructive birds in North America. Yet they do not extend very far north. There is a singular bird belonging to this species found in Cornwall, in the Hebrides, and in some parts of Wales, called the red-legged crow. It is of an elegant, slender make; active, restless, and, when brought up tame, like the jackdaw, given to thieve. Its general colour is black, beautifully glossed over with blue and purple. The legs are of a bright orange colour, inclining to red. It is very apt to take bits of lighted sticks from the fire. It has been called, on this account, the incendiary crow; as it has been known to set a house on fire.

Indeed; it is a singular bird; but I should not like one, handsome as he is, in our house. Here is a curious thing, Papa.

Yes, it is the *cicadi spumaria*; or the frog-hopper. This frothy matter, called by many people, cuckoo spit, is the abode of an insect.

Yes, I opened it the other day, and out it leaped; so that I did but just see it.

It pours forth this frothy matter to hide itself from other creatures that would devour it; or, as a screen from the heat of the sun. It has a beak, and is of the order hemiptera, or half-winged. There are more than fifty species of them. When they reach their perfect state, they leap very nimbly, and sing among the grass in a very lively and pleasing manner, nearly through the whole of the day.

See this finely-shaped tree, Papa; how full it is of blossoms, and how pleasant they are to the smell.

It is the lime-tree. It is a handsome tree, and is used for carving, and making trinkets, and pill-boxes. Its inner bark has been used for paper. The famous Cardinal Mazarin had a work of Cicero written on it in his library. Baskets and cradles, cages and lattice-work, are made of it. The name botanists give it is *Tilia*. What class is it?

Here are many stamens, standing on the receptacle; it must be of the Polyandria class. The poppy,

larkspur, and anemone, belong to it. Here is but one pointal; it must be of the first order; or Monogynia. But here is an insect eating the flower, Papa, which is more wonderful than the tree.

Truly it is; God has not formed a more wonderful insect than the bee;* here are a great many of them. They find out flowers of every species, and enrich themselves with their spoils.

And see, they are all over this field of beans which are in full blossom.

Truly, they are; we may indeed say with our poet Thomson,

“ Here their delicious task, the fervent bees,
In swarming millions tend; around, athwart,
Through the soft air, the busy nations fly,
Cling to the bud, and, with inserted tube,
Suck its pure essence, its ethereal soul;
And oft, with bolder wing, they soaring dare,
The purple heath, or where the wild thyme grows,
And yellow load them with the luscious spoil.”

* Of the order hymenoptera, or membrane-winged.

Linnæus mentions more than fifty species of bees ; but this bee on the lime, and in the bean-field, is the *apis mellifica*, or the common bee, which is by far the most valuable of them all. Each hive has a monarch, who is their queen, and the mother of the rest. The drones are larger than the others, and are the male bees. Observe them,—they have two horns, which shield their eyes, and warn them of danger. They have a trunk, which they can put out and draw in at their pleasure, and by which they readily rifle the flowers of their sweets. They have a bag, which, when full, is the size of a small pea, in which they deposit their honey till they lay it up in the comb. They have six feet; with the two first, and their fangs, they form the wax, of meal of flowers, into balls; with their middle feet they place these in a hollow formed for their reception in their hinder legs, which are hairy to hold it. The queen and the working bees have stings, with which to defend themselves against their enemies. They not unfrequently leave their sting in the wound, and die.

How busy they are, Papa.

They are ; they will make a honey-comb of double cells, sufficient to lodge three thousand bees, in twenty-four hours. They are a pattern of industry. See, they lose no time abroad ; as soon as they have examined one flower, they are off to another. And in the hive all is industry,—some build the cells ; others deposit the honey in its place ; others close up with cement every chink, to keep out the wind, or insects ; others carry out any nuisance ; or if too heavy, they effectually encase it, that it may not annoy them. How should we emulate their diligence, in seeking after the treasures of knowledge and wisdom, and the good that is imperishable.

I have always been struck, too, Edward, with the willingness with which these surprising insects help one another ; and with their disinterestedness. They will meet one that is heavily laden, and take a part of his burden. They form one family, each labours for the good of all. There is no avarice, or selfishness, among them. And what an example of providence

are they; how carefully do they lay up their sweet stores for the cold months of winter, in which they can gather no honey.

What a surprising insect. Will you tell me about its sting?

It is a wonderful weapon; "Mr. Derham counted on the sting of a wasp eight beards on the side of each dart, somewhat like the beards of fish-hooks; and there are the same number on the darts of the sting of a bee. When these beards are struck deep in the flesh, if the person starts before the insect can disengage them, the sting is left behind in the wound; but if he have patience, the bee brings the hooks down close to the sides of the darts, and withdraws the weapon."

Yes, Papa, but who could be quiet, and stand still, in such circumstances?

Some persons, of great self-possession, have done it. Thousands of bees will hover about any one who is tranquil, without attempting to injure him; but if he endeavours to drive them away, he is sure to be a suf-

ferer. It has been affirmed, that a person is in safety amidst a whole hive of these insects, if he will breathe only through his nostrils, and with gentleness.

How do the queen and drones differ from the other bees?

As they never collect wax, they have not that cavity I named in the thigh in which to put it, which the working bees have. The drones are rather larger than the working bees; but they are driven out of the hive, or killed, before the end of August. The queen is much longer and larger than the other bees; her legs and belly are of a deep yellow, like the most pure gold. If she be missing, the whole hive is thrown into the greatest confusion; and order is restored the moment she re-appears. She will produce ten or twelve thousand bees or more, in the space of two months.

Bees generally discern an approaching storm, or shower, and hasten home. Very few of them are ever overtaken by rain or tempest. It is surprising how far they will go, and yet readily return to their own garden and hive. Two gentlemen were once riding

over a furze common; one of them said, My bees are very busy here this morning. The other questioned whether the bees were his; to decide the point, a servant shook the flour dredger over the bees as they left their hive, the next day; and the gentlemen who had previously reached the common soon saw the little labourers arrive powdered over with the flour. Our delightful poet, Rogers, ascribes this ability in the bee to find its way to its memory;—

“Hark, the bee winds her small, but mellow horn,
 Blithe to salute the sunny smile of morn;
 O'er thymy downs she bends her busy course,
 And many a stream allures her to its source.
 'Tis noon, 'tis night. That eye so finely wrought,
 Beyond the search of sense, the soar of thought,
 Now vainly asks the scenes she left behind.
 Its orb so full, its vision so confin'd!
 Who guides the patient pilgrim to her cell?
 Who bids her soul with conscious triumph swell?
 With conscious truth retrace the mazy clue,
 Of varied scents, that charm'd her as she flew?
 Hail, Memory, hail; thy universal reign
 Guards the least link of Being's glorious chain!”

I wish, Papa, you could tell me about the combs; they are so curious.

They are, indeed, very wonderful. The bees form them of pure wax, which they make from the honey; a circumstance not generally known, and serve as a place to lay up their stores, and as a cradle for their young. Between each there is a space sufficient for two of the bees to march abreast. There are also holes, or by-ways, which cross the combs transversely, and by which the insect may make a short cut from one comb to another, without going a great way round. Dr. Barclay of Edinburgh first discovered, that "the partitions between different cells, at the sides and the base, are all double; or, in other words, that each cell is a distinct, separated, and in some measure an independent structure; and that each cell, when the cement is destroyed, may be entirely separated from the rest."

How exactly the cells resemble each other in the honeycomb.

They do; it is a surprising piece of architecture.

“There are only three possible figures of cells, which can make them all equal or similar, without any useless interstices; the equilateral triangle, the square, and the regular hexagon. The last is the most proper for convenience and strength; the bees, as if they knew it was the case, have chosen it for the shape of their cells. As the combs have cells on both sides, the cells may either be exactly opposite, having partition against partition; or the bottom of a cell may rest upon the partitions between the cells on the other side, which will serve as a buttress to strengthen it. The last is the strongest; accordingly, the bottom of each cell rests on the point where three partitions meet on the other side, which gives it all possible strength. It has been demonstrated that by making the bottoms of the cells to consist of three planes meeting in a point, there is a saving of material and labour by no means inconsiderable. The bees, as if acquainted with these principles of solid geometry, follow them most accurately; the bottom of each cell being composed of three planes, which make obtuse angles, with the side

partitions and with one another, and meet in a point in the middle of the bottom; the three angles of this bottom being supported by three partitions on the other side of the comb, and the point of it, by the common intersection of these three partitions."

"It is a curious mathematical problem," says Dr. Reid, "at what precise angle the three planes which compose the bottom of a cell, ought to meet, in order to make the greatest possible saving of material and labour. This is one of those problems belonging to the higher parts of mathematics. The celebrated Mac Laurin resolved it by a calculation which is to be found in the Transactions of the Royal Society. Upon the most exact mensurations he afterwards found, that it is the very angle in which the three planes in the bottom of the cell of a honeycomb do actually meet."

But who taught the bees mathematics, and taught them to solve problems, Papa?

"If a honeycomb were a work of human art, every man of common sense would conclude, without hesitation, that he who invented the construction must

have understood the principles on which it was constructed. I need not say, that bees know none of these things. They work most geometrically, without any knowledge of geometry; somewhat like a child, who by turning the handle of an organ makes good music without any knowledge of music. The art is not in the child, but in him who made the organ. In like manner, when a bee makes his combs so geometrically, the geometry is not in the bee, but in that great Geometrician who made the bee, and made all things in number, weight, and measure.”

There is nothing derogatory to the divine Majesty to suppose his wisdom to be employed in imparting ability to this insect to form its cell with the greatest skill. It may, as a foreign writer remarks, be of but little consequence to the world, whether the bee employs its wax with the greatest frugality or not; but it imports much to the insect, and, therefore, is not unworthy of the attention of the Creator. If the precision in the structure of its comb is useful for any purpose, however small, that utility, multiplied by the

number of all the bees which have been, which are, and which may be, rises to a very considerable amount.

What a wonderful little creature the bee is! And its song, Papa, is very pleasant; I love to hear it. When the bees hum around me, I always think of sunshine, and sweet fields.

All the sounds heard any where in creation, with very few exceptions, afford me a species of gratification.

The poet Cowper thought just as you did. In the letters you lent me, I marked a fine passage in which he says the same. I am sure you will be pleased to hear it. Shall we sit down on this stile, and read? I have the volume with me.

Do, Edward; you know I like all the productions of his elegant mind.

“We,” he says, in a letter to a friend, “keep no bees; but if I lived in a hive, I should hardly hear more of their music. All the bees in the neighbourhood resort to a bed of mignonette, opposite to the window, and pay me for the honey they get out of it,

by a hum, which, though rather monotonous, is as agreeable to my ear, as the whistling of my linnets. All the sounds that nature utters are delightful, at least in this country. I should not, perhaps, find the roaring of lions in Africa, or of bears in Russia, very pleasing; but I know no beast in England, whose voice I do not account musical, save and except always, the braying of an ass!"

A very proper exception, Edward.

"The notes of all our birds and fowls please me, without one exception. I should not indeed think of keeping a goose in a cage, that I might hang him up in the parlour for the sake of his melody; but a goose upon a common, or in a farm-yard, is no bad performer.

"And as to insects, if the black beetle, and beetles indeed of all hues, will keep out of my way, I have no objection to any of the rest; on the contrary, in whatever key they sing, from the gnat's fine treble, to the bass of the humble bee, I admire them all. Seriously, however, it strikes me as a very observable instance of providential kindness to man, that such an exact ac-

cord has been contrived between his ear, and the sounds with which, at least in a rural situation, it is almost every moment visited. All the world is sensible of the uncomfortable effect that certain sounds have upon the nerves; and, consequently, upon the spirits. And if a sinful world had been filled with such as would have curdled the blood, and have made the sense of hearing a perpetual inconvenience, I do not know that we should have had a right to complain.

“There is somewhere in infinite space, a world that does not roll within the precincts of mercy; and as it is reasonable, and even scriptural to suppose, that there is music in heaven, perhaps, the reverse of it is in those dismal regions. Tones so dismal, as to make woe itself more insupportable, and to acuminate even despair.”

This, Edward, is indeed a striking letter. The close of it is most solemn. It should awaken us to examination and prayer. We are near home: and if it were not, the case, I should have no inclination to think or speak on any other subject.

WALK IX.

CONTENTS.

WATER—HEAT—BEES—HUBER—LINES ON THE TREE—POPPIES—
NIGHTSHADE—MOLES—HEDGE-HOG—THE THRUSH—MAGPIE—SHEEP
—WOOL—GNATS.

You spoke, Papa, in one of our last walks, of the usefulness of rain. Water seems to mingle with every thing.

It does. The whole system of the creation would stand still,—and not only stand still, but really fall to pieces without it. We are not so well acquainted with any one of the elements as we are with water.

In what a variety of forms it is presented to us.

It is ; first in the chrystal spring, gently trickling out of a small crevice on the side, or at the base of a hill or mountain ; then filling the transparent basin, and forming the beautiful lake, reflecting on its polished surface, as in a mirror the face of the delighted

visitor, the figure of the trees and shrubs on its banks, and of the cattle cropping the tender grass. Passing from the lake, it forms the rivulet, and the stream; and, after watering and fertilizing a large tract of country, it pours its torrent into the immeasurable deep. And how different it appears in the calm lake, and in the boisterous ocean.

But, as you said, Edward, rightly, it mingles with every thing. It penetrates every where, and forms a part of earths, minerals, and stones. The sun draws it up from the surface of the sea; thus it forms clouds, which are scattered in salutary showers all over the habitable globe. In winter, it forms snow, which is as a mantle to shield the grass and the vegetables from the intense cold; the surface of the river becomes ice, greatly accelerating, in some countries, the intercourse of the inhabitants. In spring, this fluid penetrates the earth and the seeds which are deposited in its bosom, which makes them germinate, and lift up their beautiful verdure above the surface of the ground, forming the fine landscape, and adorning every part

of the creation. Without water no plant or tree would vegetate; nor could any creature exist; the wide world would be one vast scene of devastation. The hardest parts of trees and vegetables are not without water, and the softer are almost wholly formed of it. This is equally the case with the animate, as well as the inanimate parts of the creation.

It is a most singular circumstance, that the pressure of water is not in proportion to its bulk, but to its height; so that a long small tube holding only two or three pounds of water, will give a pressure of twenty or thirty tons; and if the length of the tube be increased, even a much greater weight.

You have not noticed the wonders it performs in the shape of steam.

True, Edward; nor in many other respects. Nor have we noticed the wonderful power that puts this element, and indeed every thing into motion. The whole creation would be a stagnant mass, without the power to which I refer. Do you know what it is?

Is it heat, Papa?

Yes, in the nice adjustment and general circulation of different degrees of heat. Were the heat to be very much diminished, we could have no spring, summer, or autumn. One cheerless winter would afflict the world. A much less quantity of heat would bind up every thing in a lasting frost; and a much greater quantity, and the water would be all transformed into vapour, life would become extinct; and even the hard and massy parts of creation would separate, and be broken into pieces. How necessary, and how beautiful are the divine arrangements!

And how wonderful an insect is the bee, of which we conversed in our last walk; I wish you would tell me more about them.

I will lend you a book on the subject written by Huber, a Swiss, who was a blind man; I think this is the best treatise I have seen on the subject.

A blind person write about bees, Papa, and write well! Why, how could he see them to make his observations?

Of course, he could not see them; but his intelligent

wife lent him her eyes ; and from her reports to him, he deduced many important facts relative to this surprising and useful insect.

In one of my books this morning, I met with some verses about the bee which are very pretty ; shall I repeat them ?

If you wish, do so, Edward.

“ Thou cheerful Bee, come, freely come,
And travel round my woodbine bower ;
Delight me with thy wandering hum,
And rouse me from my musing hour ;
O try no more yon tedious fields,
Come taste the sweets my garden yields,
The treasure of each blooming mine,
The bud, the blossom, all are thine !

And, careless of this noon-tide heat,
I'll follow as thy ramble guides,
To watch thee pause, and chafe thy feet,
And sweep them o'er thy downy sides ;
Then in a flower's bell nestling lie,
And all thy busiest ardour ply ;
Then o'er the stem, tho' fair it grow,
With touch rejecting, glance and go.

O nature kind ! O labourer wise !
That roam'st along the summer ray,
Glean'st every bliss thy life supplies,
And meet'st, prepar'd, thy wintry day :
Go, envied, go ; with crowded gates,
The hive thy rich return awaits ;
Bear home thy store, in triumph gay,
And shame each idler on thy way !”

They are very pretty, Edward. And, indeed, it would be well, if the “idlers” in every village and neighbourhood, who are trifling life away, could be shamed by this laborious insect to a becoming industry in the acquisition of those great blessings which shall render them happy and useful in life, and happy for ever !

How inviting those poppies look among the corn ; I will go and gather one for our examination. See, how deeply and beautifully red the flower is.

Or, to speak as a botanist, the corolla is. How would you distinguish the corolla ?

Let me see, it is formed of four leaves ; it must be called tetrapetalous, or a flower with four leaves. It has many stamens standing on the receptacle ; and

is, therefore, of the class Polyandria; it has but one pointal, and must be of the first order, or Monogynia.



There are many varieties of the poppy; some of them are very beautiful, growing to the height of five or six feet, with heads as large as oranges; containing, at least, eight or nine thousand seeds.

Is not opium the produce of the poppy?

It is the juice of the *papaver album*, or white poppy. The fields in the east are often sown with it, as ours are with corn. When the heads are nearly ripe, a

person wounds them with an instrument which has five edges, which makes five long incisions; the opium flows from these, and is collected the day after, by labourers, into suitable vessels. At the same time the collector makes five more wounds on the opposite side of the head of the poppy; and this, the next day, yields opium, but inferior to the first. They mix a little honey with it, and work it till it becomes thick enough to be made into rolls or cakes; in which form it is sent to us; it is used for a variety of purposes, especially in medicine.

Does it not compel a person to go to sleep whether he will or not?

This is certainly very much its effect.

But how does it do so?

I cannot so readily answer this question, Edward. I know no more how this result takes place, than how the mind acts on the powers of the body. The people of the east take it very much as the inhabitants of Europe drink ardent spirits, and for the same purposes. It is a compound of gum, resin, essential oil,

salt, and earthy matter. Taken in any quantity it is a deadly poison.

And here is another poisonous plant, Papa? Is it not the nightshade? It is covered with berries.

Yes, it is the *atropa belladonna*, or deadly nightshade. Can you tell me its botanical position?

No, Papa; because there are no flowers, but only berries.

The flower has five stamens, and is, of course, of the ——

Pentandria, or fifth class, Papa.

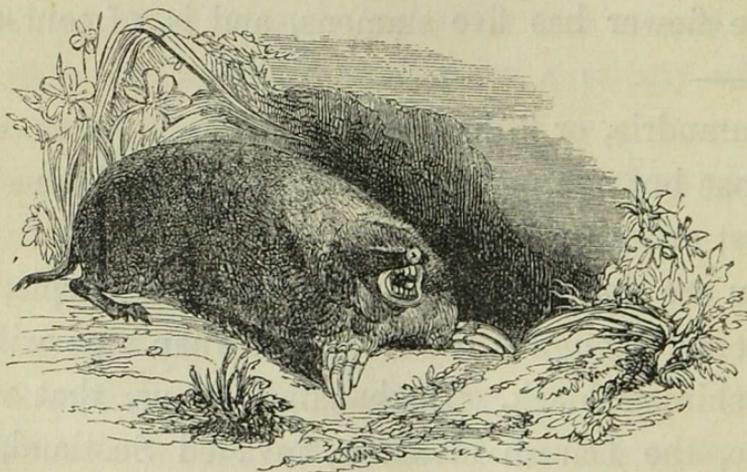
It has but one pointal, and so must be of the——

First order, or Monogynia.

You are right, Edward. The flower is purple, and the berry, though it is now green, when ripe will be of a shining black. Buchanan tells us, that when Sweno, the Danish monarch, invaded Scotland, the Scots mingled a quantity of the nightshade berries with the drink with which, according to a treaty of truce, they were to supply the Danes, and which intoxicated the soldiers, so that the Scottish forces at-

tacked, and readily cut off nearly the whole of them. The king himself escaped with much difficulty. As children are apt to gather and eat these berries, it ought to be known, that a glass of warm vinegar is an instant remedy against the bad effects of the poison.

What a number of mole-hills there are in this field, Papa; don't they do a great deal of damage to the farmer?



No doubt they do, Edward, in many cases. Its coat is one of beautiful velvet. Its fore-feet are very broad, and are furnished with large broad nails, and which admirably fit it for digging and throwing up the

earth ; by doing so, it procures insects and worms, on which it feeds.

I saw one nailed up against a barn the other day ; it had been just killed ; I could not see that it had any ears or eyes.

They are generally thus fixed upon stables and barns by those who catch them. As the creature lives in the dark, it has no occasion for eyes ; most likely it discovers its food by its smell. Yet it has both eyes and ears, which are concealed beneath its thick fur.

It would want them when out of its burrow, to know when any danger was near ; and also to find its way to its habitation. But see, how it has filled and spoiled this field.

It has done much mischief. Our favourite poet prettily alludes to this animal. Speaking of the ascent from a rustic bridge in Sir John Throckmorton's park, he says,

“ Hence, ancle deep in moss, and flowery thyme,
We mount again, and feel at every step
Our foot half sunk in hillocks green and soft,
Rais'd by the mole, the miner of the soil ;

He, not unlike the great ones of mankind,
 Disfigures earth ; and, plotting in the dark,
 Toils much to earn a monumental pile,
 That may record the mischiefs he has done.”

But what has Flora found by that furze-bush ; she
 is barking at it, but dares not touch it ; see what it is.

* * * * *

Come and see it, Papa ; it is a creature all covered
 over with thorns.

Oh, I know what it is ; it is a hedge-hog. Poor
 Flora’s nose is bleeding ; you may easily see why
 she barked, but would not attack it again.

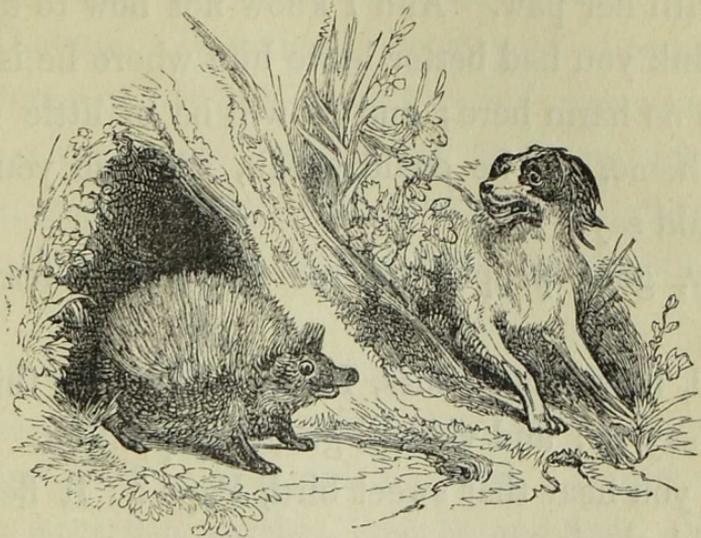
It is a curious creature.

It is ; when pursued, or in danger, it always rolls
 itself up in this way till his foe is gone, when it opens
 and runs to its cell.

Is there no way of making it open ?

You see, Flora does not know of any ; she has
 given up the very attempt to open it. If put into
 water it will open, and swim about. They feed on
 beetles, insects, and fruits. They usually take up
 their abode in woods, hollow trees, and among rocks.

They seldom come abroad by day; and, as they sleep all the winter, they want no food. Mr. White says, in a letter to Mr. Pennant, "Hedge-hogs abound in



my gardens and fields; the manner in which they eat the roots of the plantain in my grass walks, is very curious; with the upper jaw, which is much longer than the lower, they bore under the plant, and so eat the root off upwards, leaving the tuft of leaves untouched. In this respect they are useful, as they destroy a very troublesome weed.

Shall we carry him home, Papa?

Ask Flora if she will carry him?

I am sure she will not; see how she is wiping her nose with her paw. And I know not how to do it.

I think you had better leave him where he is. He will do no harm here; and he will be of little use to us at home. If he could speak, what do you think he would say?

Pray, good people, let me alone, and leave me here.

Well, that is not amiss, Edward; I really think he would say so; and we will grant his petition.

Did you hear that sweet bird, Papa? It fled over the field singing.

Yes, it is the Missel Thrush. It is of the order Passeres; there are one hundred and thirty-six species of thrushes,—seven of them only are found in Britain. This is the largest of them all. It lays four or five eggs, stays with us the whole year; and has, as you remarked, a sweet song. “Whilst breeding,” Mr. White says, “the missel thrush is very fierce and

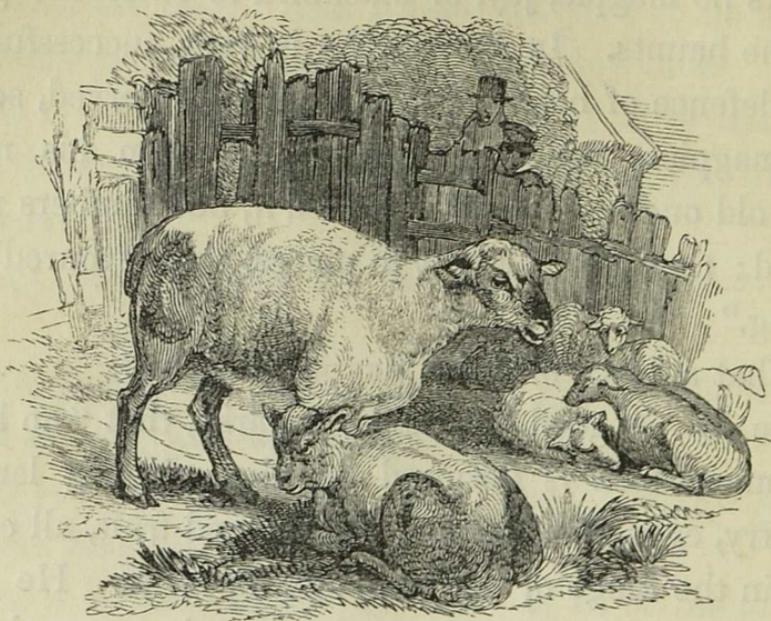
pugnacious, driving such birds as approach its nest, with great fury, to a distance. The Welsh call it *pen y Elwyn*, the head, or master of the coppice. He suffers no magpie, jay, or blackbird to enter the garden he haunts. In general, he is very successful in the defence of his family; but once I observed, several magpies came, determined to storm his nest. The old ones resolutely defended it, but numbers prevailed; they tore the nest to pieces, and devoured the young."

What a fierce bird the magpie must be !

He is. A good naturalist remarks, that "no kind of animal food is despised by him. Young lambs, poultry, eggs, fish, carrion, insects, and fruit, all come within the range of his voracious appetite. He is a great enemy to all young birds; and, in many places, commits extensive ravages on the brood and eggs of game. In many places in England and Ireland, a reward is given for their heads."

What a noise the sheep make in the home field by the farm-yard !

I see, they have been depriving them of their warm fleeces. Though they complain aloud, it must be much for their comfort this warm weather.



Do you think then, Papa, that they are troubled by the heat?

Yes; and not only are they inconvenienced by the large quantity of wool in this way, but it harbours many troublesome insects which torment the poor

animal. The sheep is one of our most useful creatures, and is of the class mammalia, which, as you know, is the first of the six classes of the animal kingdom; according to the arrangement of Linnæus; do you recollect what animals are included in this class?

All that suckle their young.

Yes.

Are there not various kinds of sheep?

There are; all have not wool; some have hair like the goat. They are among the most defenceless of animals. Can you mention the principal services it renders to man?

It manures the ground; its skin is made into parchment; its flesh forms a part of our principal food; its entrails, I have heard, furnish strings for some musical instruments; and every one knows that we are clothed with its wool. How prettily does our poet Thomson describe the interesting scene which is now before us!

He does; he notices the flocks of "snowy whiteness," gathered in "the wattled pen;" and the house-

wife, waiting with her attending maids, to roll up the fleeces. "Some," he says,

* * "Mingling stir the melted tar, and some,
 Deep on the new-shorn vagrant's heaving side,
 To stamp the master's cipher ready stand ;
 Others th' unwilling wether drag along ;
 And, glorying in his might, the sturdy boy,
 Holds by the twisted horns th' indignant ram.
 A simple scene ! Yet hence Britannia sees
 Her solid grandeur rise !"

In the way of our commerce, I suppose he means, Papa?

Certainly.

But would not the wool fall off every year, without the trouble of shearing?

It would ; but in small quantities at a time, which would be scattered and lost ; nor would it be so good as it is when sheared,—as we saw it just now. The part of the fleece which grows in the winter, is finer than the summer growth. Every fleece has in it wool of a different fineness. The Spanish sheep are nearly all black, and their wool is justly famed for its excellent qualities. It is affirmed, that our colonies

in New Holland are expected to rival them, and that too, very speedily, in this important article. But we must bend our course homewards.

See, the myriads of gnats, Papa, round the hedges and trees; they seem like clouds of smoke.

Truly, they do. They are of the fifth order, hymenoptera, or membrane-winged. The fibres of the wings branch over the form of the insect.

The class hymenoptera, or membrane-winged, are very much like the class neuroptera, or nerve-winged; how do you distinguish them?

The insects of the former have a sting, those of the latter are without them. The parent gnat lays from two to four hundred eggs, very small, of course, of a brown colour; she leaves them on the water, all cemented together, near some water plant. They are hatched on its surface. The little larva can moisten their tails with a kind of oil, and thus they swim, as they are lighter than the water. When the water moves, they sink, by four small fins, to the bottom for safety; and come up again when all is tranquil.

They go through several changes till the perfect insect appears, and leaves the water for the air. I will show you one of them through my microscope; you shall see the fine plume of feathers which he bears upon his head. His sting, which he has in a sheath, is a most curious instrument.

I have felt its sting, Papa; it knows how to wound pretty deeply.

It does; it consists of several minute lancets; it is not a point, as is generally supposed. Some of these lancets are double-edged, and others are barbed, like the head of an arrow. It wounds in an instant, and pours a fluid into the cavity it has made, which creates the pain. I have understood, that rubbing the wound with the leaf of the sweet-briar will alleviate the pain; or, bathing it with cold water will produce the same effect. The insect will not attack the hands or the countenance which have been washed with vinegar.

It is no wonder, if they lay three or four hundred eggs, that they should be so numerous.

True; but they have many enemies; multitudes

on multitudes are devoured by the birds. If this were not the case, they would be a great nuisance, and the clouds of them would really darken the sun by intercepting his rays. How wonderful a Being must he be, who has created all the wonders which we behold. We should endeavour to see his adorable hand in the minute, as well as in the great. In the little gnat, or the mite, as well as in the vast planet which revolves in its orbit around the sun. "All earthly enjoyments and possessions, rested in, and viewed without a reference to their Author, are but baubles. Yea, the planets, and the sun itself, are but baubles. Better for a man never to have seen them, or to see them with the eyes of a brute, stupid and unconscious of what he beholds, than not to be able to say, "The Maker of all these wonders is my friend!"* O seek for his favour, Edward, with your whole heart!

"O seek him,—in his favour life is found;
All else besides, a shadow, and a sound!"

* Cowper's letters.

WALK X.

CONTENTS.

GNATS—WORKS OF NATURE AND ART—CONTRAST BETWEEN THE WORKS OF MAN AND OF GOD—BEANS—THE APHIS—SPIDERS—OF THEIR DIFFERENT SPECIES—GOSSAMER—HOLLY—BUTCHER BIRD—THE SWALLOW—MALLOW TREE—THE BAT—ALL THE WORKS OF GOD SPEAK THEIR MAKER.

I HAVE been looking, Papa, at a gnat this morning through the microscope. His eyes are like two little pearls; and his dress is of purple, and green, and gold.

Generally speaking, insects are always beautiful objects, seen through a good glass. The lines of Mrs. Barbauld on this subject are very correct, whilst they inculcate a most important lesson;—

“ So the bright train, their radiant wings unfold
With silver fring’d, and freckled o’er with gold;
On the gay bosom of some fragrant flow’r,
They, idly fluttering, live their little hour;
Their life all pleasure and their task all play,
All spring their age, and sunshine all their day!

Not so, the child of sorrow, wretched man ;
His course with toil concludes, with pain began ;
That high his destiny he might discern,
And in Misfortune's school this lesson learn,—
Pleasure's the portion of the inferior kind,
But Glory, Virtue, Heaven, for Man design'd !”

What a contrast there is between the works of God, and those of man ! A small piece of fine gauze, is a sort of coarse yarn, or cable, compared with the thread of the silk-worm, or the wing of the butterfly : how perfect is the line of the one, and how brilliant are the scales on the other.

The Lord's prayer which I have, written on a bit of paper about the size of a sixpence, seen through the glass, is uneven, and rough, and appears but a clumsy performance, but how smooth, and how beautiful are the plume, and the wings of the gnat !

The sting of a wasp, or of a bee, is exquisitely finished ; and the point of the most delicate needle, when placed near it, is but a rude bar of iron. Here, look at this full point at the end of this sentence, through my pocket glass ; to the eye it appears a

miniature globe,—but seen through this medium, how ragged it is. But examine, by the same means, the speck upon the insect's wing, and how perfect and beautiful it is!

And what a difference between a carved figure or painting of a pheasant, a horse, or a man, and the animals themselves!

Yes, we every where, if we will but open our eyes, may see the insignificance of man, and the grandeur of God! Man with immense labour, waters a garden, or a pleasure ground; but how readily do the clouds, at the divine command, refresh and fertilize a province or a kingdom. Man, with great expense and difficulty, lights up a small circle,—but God speaks, the sun appears, and the vast hemisphere is enlightened with his beams!

But how beautifully the artist can place the landscape on the paper, or canvass. The views on the Rhine which you lately showed me, were fine specimens of human art.

They are; but if the representation of them, which

is but as their shadow, be so beautiful, what must the scenes actually be ! Yet there is a wide difference between these elegant productions of the pencil, and the glorious works of the Most High ; the mimic works of art are indeed lovely ;—

“ But imitative strokes can do no more
Than please the eye ; sweet nature every sense,—
The air salubrious of her lofty hills,
The cheering fragrance of her dewy vales,
And music of her woods ; no works of man,
May rival these.

See, Papa, how this bean-stalk is covered over with black insects.

But how delicious is the fragrance of the bean flowers !—The bean belongs to a most important class, —that of Diadelphia, or of two brotherhoods ; it is of the third order, or Decandria. The furze, pea, vetch, saintfoin, liquorice, trefoil, and clover, are found in this class.

But I wish you to notice the black insects which are on the bean-stalk ; see how they have spoiled it.

They have indeed; it is the *Aphis*, or plant louse. There is a considerable variety of them; some of them prefer the elm, others the beech; and one kind, the *Aphis vitis*, frequents the vine; they injure the stalks, cause the fruit to wither, and even to drop off the branch soon after it appears. They also injure grain, —barley and oats as well as beans. They spoil the rose buds, and curl up the leaves of the currant, and of other trees. They are generally called blight, by the gardeners.

And they produce the honey-dew, on the leaves, do they not?

They do. They are innumerable, and do much mischief in stopping the growth, and devouring the juices which are necessary to the nourishment of the plant. Mr. White tells us, that he saw an immense shower of these insects fall in the street of Selborne; so that the persons who were without doors were covered with them, and which, for a great way round, blackened all the vegetables in the fields and gardens. It belongs to the class Hemiptera, or half-winged.

Linnæus mentions thirty-three species of them; but there are, at least, double this number. They are amazingly prolific. The naturalist, Bonnet, shut up a young one, from the moment it came into existence, which produced ninety-five more. A few males only are produced every tenth generation. And, which is very singular, in spring the young appear from small black oval eggs, that were left on the tree in the previous autumn; those in April bring forth their young alive, when there is plenty of nourishment for them.

Who would have thought, Papa, that the history of such an insignificant insect should be so wonderful!

All the works of God, are surprising, Edward. And the more we examine them, the more astonishing do they appear.

I suppose, then, if we knew all about this cobweb on the hedge, we should think it a wonderful article.

I have no doubt of this. The spider is a most singular insect. A volume of no mean size might readily be written about them. The spider belongs to the class of Aptera, or insects without wings. There are

about fifty different species that are known. The thirteen-spotted spider is found in Italy, and preys on crickets. The bites of the Venatoria spider in America, are said to produce fever and delirium; the Calycina,—so called because it hides itself in the cup of flowers, seizes on flies and even bees. The Avicularia of South America, has pangs equal to the talons of a bird of prey, and seizes the eggs of birds, and even small birds themselves. It is said, that its eyes are capable of being set as lenses and used as microscopes.

How wonderful! this one, I see, Papa, has eight legs.

They all have as many; each has three joints, ending in three crooked claws. They all have eight eyes; two before, two behind; the rest are on each side of the head. Each has a pair of sharp crooked claws, folded up like a clasp knife, between two rows of teeth. Our poet Thomson, describes what use he makes of these; speaking of the window, he says there

“ The villain spider lives, cunning and fierce,
Mixture abhor'd! Amid a mangled heap
Of carcasses, in eager watch he sits,

O'erlooking all his waving snares around !
Near the dire cell the dreadless wanderer oft
Passes ; as oft the ruffian shows his front ;
The prey at last ensnar'd, he, dreadless, darts,
With rapid glide, along the leaning line ;
And, fixing in the wretch his cruel fangs,
Strikes backward, grimly pleas'd ; the fluttering wing
And shriller sound declare extreme distress,
And ask the hospitable hand."

But how does the spider spin ?

In the hinder part it has five nipples, which it can contract or enlarge at pleasure, by which it spins. It fixes one end to some object, and then draws parallel after parallel till the web is finished, and a cell is formed for its habitation. Here the little creature sits watching for the prey that may be entangled in its net. Mr. Pope asks,

" Who bade the spider parallels design,
Sure as De Moivre without rule or line ? "

Who was De Moivre ?

A celebrated French mathematician.

Did you say, the spider has five spinning machines ?

Yes; and each of these encloses about a thousand spinnerules; so that it spins five thousand threads at once; which, at the same time, it twists into one.

This is surprising indeed.

It is,—nor is this all; the spider will extend its web from tree to tree; and, in a garden, from one wall or building to another. The gossamer spider will throw out thread after thread, and then mount on them, borne by the wind, to a great height. Mr. Ray says, that one day in October he observed the air to be full of webs; he went up to the top of York minster, and still he saw them waving very high above him.

Why do they go up into the air?

No doubt, to catch the little insects which abound in it; and, very likely, they feel a pleasure in thus sailing about. Their webs are very fine; Leuwenhoek affirms that one hundred threads of a full-grown spider are not so thick as a common hair.

Have the webs been ever put to any use?

Many years since, a Mr. Bon, a Frenchman, manu-

factured a pair of stockings from it, of a fine grey colour, but by no means equal to silk. By order of the Royal Academy, M. Raumer tried to form a colony of spiders. Between four and five thousand were distributed into cells; but the strong ones soon killed and devoured the weaker. From farther experiments, he found, that the spider's web is not to be named for a moment, with the thread of the silk-worm. Spiders would be exceedingly numerous, as they lay many eggs, but they devour one another, and they have many enemies. When I was mentioning some of the different species of this insect, I forgot to notice the *Aranea aquatica*, or water spider, which lives as in a diving bell; and swims well in any position. It is distinguished by its brightness, as the belly seems covered with a silver varnish; that arises from the oily humours of the body not permitting the immediate contact of the water. It takes one bubble of air after another under the water, and there forms its apartment. It lives on the land as well as in the water; and comes often on shore in search of food.

This is indeed a remarkable spider.

I might readily say much more about this insect; but I will lend you a short account, written by an ingenious living naturalist, on the subject.*

Thank you! Papa. This evergreen, we call holly, is a most singular tree; is it not?

It is; what is its botanical place?

Let me see,—the flower has four stamens; it must be of the class tetrandria; and it has four pointals, and must be of the fourth, or tetragynia order.

Its Latin name is *Ilex*. There are many varieties of it, which are produced by budding, or grafting on the common holly. This is a very fine tree, nearly twenty feet high. You see the shining leaves are very strong, and defended with thorns, which seem to point every way; they are placed alternately on every side of the branches. From the base of their footstalks, the flowers come out in clusters, these are succeeded by green berries,—which change about Michaelmas,

* J. Rennie; Lib. Ent. Knowl. Vol. iii. part 2.

into a beautiful red, and in winter, the whole shrub greatly adorns our hedges and gardens.

Is it of any use, except as an ornament?

Some birds will eat the berries; and bird-lime is made for its bark. Handles for knives, and other instruments, are also made from its wood.

What bird is that, Papa, which is making such a croaking, disagreeable noise from the topmost bough of yonder tree?

It is a Shrike, or Butcher-bird; all small birds have an antipathy to it. Its nest, I see, is in the tree; and is large for the size of the bird. It belongs to the order Accipitres; it is of the hawk kind. It is Linnaeus's first order of birds; the birds included in it have a hooked-bill. It is termed *lanius excubitor*, or the butcher sentinel, as it is generally seen on the look-out, or watching, as we now behold him. There are more than forty species of them. The upper parts of its plumage are of a pale ash colour, and beneath it is white; the two middle feathers of the tail are black, and the outside ones white; the legs and the bill are

black. The muscles which move the head are thick and strong; and the head is large.

Why is he called the butcher-bird?

Because he seizes small birds by the throat and strangles them. Some affirm, that when this bird has killed his prey, he fixes it on a thorn, and cuts it up, or pulls it to pieces, and then devours it. Some naturalists say, that he will mimic the voices of the smaller birds to decoy them within his reach. Our servant John caught one in a trap last winter, by baiting it with a living bird; so I had an opportunity of examining it very fully.

It would be a good thing if they were all killed, would it not, Papa?

I am not sure of this, Edward; some husbandmen think them of great use, as they destroy rats, mice, and other vermin. They are to be found in most parts of the world.

Have we only one kind in Britain?

Mr. White mentions another species, that of the red-backed butcher-bird, which a neighbour shot and gave

him. Captain Brown says it is a local species found in Somersetshire and Gloucestershire, and is a bird of passage, coming in May, and departing in September. "The species," he says, "is very voracious, preying on small birds, and fixing them on a thorn to feed on." Another naturalist tells us, that "he found four young ones, which lived in unity about two months, when they fought violently, and two were killed. The other two were chained in the manner goldfinches frequently are; they would come, when called, for a fly. When raw meat was given them, they would endeavour to fasten it to some part of their cage in order to tear it; they would eat mice, and small birds, feathers, fur, and bones, disgorging the refuse, like the hawk tribe. One was killed by swallowing too large a quantity of mouse-fur, which it could not eject."—But what have we here, Edward?

I see it is the *Lavatera arborea*, or the Mallow tree; it is a great ornament in a shrubbery. This field, I think, was once a part of the pleasure grounds of the gentleman who owns the estate.

It is of the same class of the Mallows which we have so often examined. It is monodelphious; or of one brotherhood. The plants belonging to it have all the filaments united at the base, but separate at the top. It has many stamens, and is of the Polyandria order. The juniper, geranium, mallow, yew, and fir, belong to this class, I think, Papa.

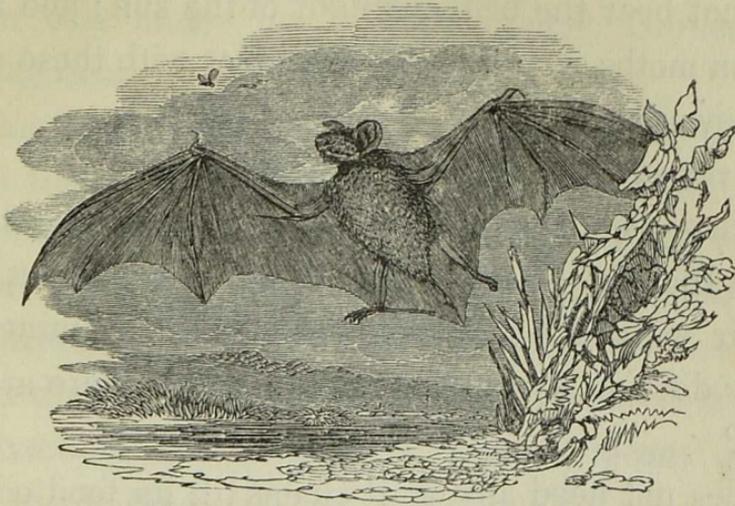
They do. This elegant shrub grows from eight to ten feet high. It has heart-shaped, angular leaves, and quinquepetalous flowers. Do you know what I mean?

The corolla, which forms the flower, is divided into five petals. I should like to have some of them in our shrubbery.

They are easily raised from the seed in spring; when I will help you in planting some.—But one of the most singular creatures which God has formed, has just flown over our heads, and reminds us that we should bend our way homewards, as the shades of the evening are drawing around us.

Was it a bat, Papa?

It was, Edward; there,—it fled over us again; it is a wonderful creature.



Is it a bird, or a beast, Papa?

Neither the one, nor the other; but a part of both. It is usually ranked among the quadrupeds, or four-footed animals.

It is a flying quadruped, then, is it?

We may call it so; there are twenty-eight species,—seven of them are found in our island. The one we have just seen is the *vespertilio murinus*, or the common bat.

How is it that it does not fly about in the day?

It is probable that its eyes, like those of the owl, could not bear the brilliant light of the sun; and as it feeds on moths, you know it can meet with these only in the evening.

I never saw one settle on the ground.

Perhaps not; they seldom do so, as they find their food in the air. And if they do so, they cannot rise on their wings till they have reached some eminence.

How does it live in the winter, when there are no moths?

It does not need any, as it sleeps till its food comes abroad again.

That is very convenient.

It has a fur like a mouse, slightly tinged with red. The owls frequently catch and devour them. Bats are often caught by means of the flower cups of the burdock, whitened, and thrown up in the air; they are attracted by the colour, and seize it; when it sticks to their wings, and they fall to the ground. There is one species of this tribe which is very dreadful.

What do you call it?

The vampyre bat; it has four large teeth in the upper and under jaw. They inhabit Guinea, and Madagascar.

I am glad there are none of them in our country.

So am I, Edward. They begin their flight in immense flocks, in the east, from island to island, as soon as the sun sets. They live partly on fruit, and will intoxicate themselves with the juice of the palm. From the size of their teeth, it is supposed they are carnivorous. Do you know what is meant by this hard word, Edward?

The Latin word *carnis*, signifies flesh; so it must mean flesh-eaters.

It does. They swarm like bees, and hang one on another from the trees in large clusters. Some have been measured, and from the tip of one wing to that of the other, have been found five feet four inches. Dampier tells us, that one which he saw extended farther than he could reach with outstretched arms. They are found with bodies from the size of a pullet

to that of a dove; when taken, they bite and resist with great fierceness; and their cry is horrible. Some travellers tell us, that in Java, they have been known to attack an individual whom they have found with his feet uncovered; and, whilst they have drained his body of the vital current, they have fanned him into so profound a sleep by their wings, that he has never awaked. But Bishop Heber, in his Journal in India, questions the correctness of this statement.

This is dreadful, indeed. But what a delightful walk we have had! All the way home the landscape has been charming; the whole creation seemed to sing for joy.

I am glad, Edward, you view things in this light. Well does Paley remark, that "in a moral view, if one train of thinking be more desirable than another, it is that which regards the phenomena of nature with a constant reference to a supreme intelligent Author." "All his works speak of Him. The plain, which gradually escapes from my eye, and the capacious vault of heaven, which encompasses me on every side,

convey an idea of his immensity; the fruits suspended on the bough within reach of my hand, announce his providential care; the constant revolution of the seasons displays his wisdom; the variety of provisions which his bounty makes in every climate for the wants of all that live, the stately port of the forests, the soft verdure of the meadow, the grouping of the plants, the perfume and enamel of flowers, an infinite multitude of harmonies, known and unknown, are the magnificent languages which speak of Him to all men, in a thousand and a thousand different dialects.”*

* St. Pierre.

WALK XI.

CONTENTS.

THE IMPORTANCE AND EXCELLENCE OF RELIGION—THE TAME BAT—
WORMS—THE NUTHATCH—SPARROW-HAWK—THE EAGLE—THE FAL-
CON—FALCONRY—THE MOUNTAIN ASH—GROWTH OF TREES—THE
WAGTAIL—THE GOLDFINCH—THUNDER AND LIGHTNING—THE GRAN-
DEUR OF GOD.

I HOPE, my dear Edward, you do not forget those serious remarks, which are so often necessarily suggested to us by the wonderful and beautiful works of the Most High. To forget constantly to pray for the divine blessing, and to neglect to praise our Creator, Preserver, and Benefactor, would prove that we are deficient in rationality, and are wanting in gratitude; and, indeed, that we are destitute of all those noble moral qualities which ought to distinguish our race from the brute creation.

I hope, Papa, that I do not forget, that “the fear

of the Lord,"—by which, you say, we are to understand the love and service of the Most High,—is, indeed, "the beginning of wisdom."

True, Edward; no one has even begun to be wise, who does not love and serve God.

I do try often to think, how great, and how good God is; I call on him by prayer and praise each morning and evening; and often, through the day, I implore his blessing. It is a source of much pleasure to me to do so.

I rejoice, my dear Edward, to hear it. We cannot properly enjoy the works of God without proper sentiments and feelings towards their Author;

"His presence, who made all so fair, perceiv'd,
Makes all still fairer."

And if we pray, and praise God as we ought, it will be our perpetual delight to think, and speak, and act in such a manner as will please him. It is a little, and a depraved mind, which is insensible to the claims of conscience and of God. Milton and Newton, Boyle and Locke, and the best and noblest of

our race, have been conscious of the sublimest enjoyment in the service of the Most High.

And if his works are so beautiful and glorious, as we see they are, what must he be who has formed them all, and formed them all, too, out of nothing !

True, Edward ; never forget to pray to him, and to praise him ; to serve and to glorify him ; nor rest satisfied till you have found his favour, and the forgiveness of all your sins, through the merits of his dear Son. I was lately reading the letters of the great Lord Chatham to his nephew at Cambridge. There is one passage which I wish you especially to consider. “I now come,” says he, “to the advice I have to offer you, which most nearly concerns your welfare, and upon which every good and honourable purpose of your life will assuredly turn ; I mean, the keeping up in your heart the true sentiments of religion. If you are not right towards God, you can never be so towards man. The noblest sentiments of the human breast, are here brought to the test. Is gratitude in the number of a man’s virtues ? If it be,

the highest Benefactor demands the warmest returns of gratitude, love, and praise. If a man wants this virtue, where there are infinite obligations to excite and quicken it, he will be likely to want all others towards his fellow-creatures; whose utmost gifts are poor, compared to those he daily receives at the hands of his never-failing, Almighty Friend. ‘Remember thy Creator in the days of thy youth,’ is a precept big with the deepest wisdom. This is eternally true, whether the wits and dissipated young men of Cambridge allow it or not. Hold fast, therefore, by this sheet-anchor of happiness, Religion; you will often want it in the times of most danger,—in the storms and tempests of life. Cherish, then, again I say, true religion; it is the perfection and the glory of human nature.” * * * *

Last evening, Papa, when we returned from our walk, I opened Mr. White’s Natural History of Selborne, to see what he says about the bat; and I found a curious passage about one that was so tame, that it fed out of the hand of a person.

Indeed; I had forgotten that I had ever heard of a tame bat.

Here the passage is,—in a letter to Mr. Pennant, he says, “I was much entertained last summer with a tame bat, which would take flies out of a person’s hand. If you gave it anything to eat, it brought its wings round before its mouth, hovering and hiding its head, in the manner of birds of prey when they feed. The adroitness it showed in shearing off the wings of the flies, which were always rejected, was worthy of observation, and pleased me much. Insects seemed to be most acceptable, though it did not refuse raw flesh when offered. It ran with more dispatch than I was aware of, on the floor, but in a most ridiculous and grotesque manner.

“Bats drink on the wing like swallows, by sipping the surface, as they play over pools and streams. They love to frequent waters, not only for the sake of drinking, but on account of insects, which are found over them in the greatest plenty. As I was going some years ago, pretty late, in a boat from

Richmond to Sunbury, on a warm summer's evening, I think I saw myriads of bats between the two places; the air swarmed with them all along the Thames, so that hundreds were in sight at a time."

It is a very remarkable account; I should never have thought of taming a bat.

Did you see, Papa, in the last field, how the worms had come out all over it?

I did; the late rains have softened the ground, and brought them to the surface.

Are they of any use, Papa?

Yes, certainly; they are food to many kinds of birds; the hedge-hog, mole, and frog also devour them. They do great good by way of manuring the pastures, as they throw up much fine soil around the roots of the grass. They are most active in spring, when their services are most needed; but they are more or less active all the year. A shower of rain will put them in movement at almost any time.

What a multitude there must be in the bosom of the earth!

They must be innumerable; and, no doubt, fill an important link in the mighty chain of God's works, much as they may be overlooked and despised by many who ought to know better.

Our gardener said, he did not like them, for they spoiled his walks, and did much mischief.

But they do much good, though they may make him a little extra work. They are, certainly, a minor sort of agriculturists, who, though they have no such design, yet greatly prepare the ground for fruitfulness. Without their labours, the earth would soon be hard and barren. They never damage the roots of vegetables. I have observed, that lands which are often under water, are very poor, and the grass is coarse, and good for little. I suspect that one reason is, because the worms are drowned, or have left it.

Do worms produce their young alive? The gardener says they do.

This was long supposed to be the case; but it is now ascertained, that they lay long eggs, which are fringed with a sort of membrane at each end. Worms

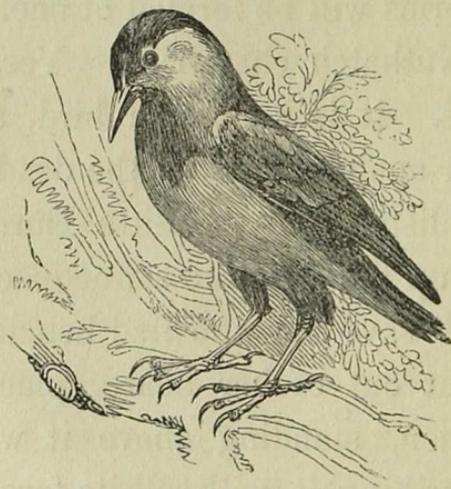
belong to the sixth class of Linnæus, that of Vermes, or worms; these are of the first order in the class *Lumbricus-terrestris*, but there is a great variety of worms.

Are they not composed of rings?

They are; each has one hundred and forty; and every ring has a pair of bristles. If one be cut into three pieces, one part will produce a head, the other a tail; and the middle part, both a head and a tail. Thus three worms will be formed of one. But listen,—I hear the Nuthatch chattering. Yes, that is her note, or noise. It is a singular bird, and makes a strange clatter against pales, or the dead branches of trees. Naturalists call it the *Sitta Europea*. There it is, running up the tree like a woodpecker. “It is a pretty sight,” says one who had beheld it, “to see her fetch a nut out of her hoard, place it fast in a chink; and then, standing above it with its head downwards, striking it with all its force, break the shell, and catch up the kernel. When in a cage, it does not sleep on a perch, like other birds, but in a corner.

Is it common, Papa? I never saw one before.

I think not. Its habits are singular. It makes a rough nest in the hole of a tree; if the entrance be too large, the bird stops up a part of it with clay very carefully, till the cavity corresponds with its size. If any one should put his hand or a stick into the opening whilst the old one is sitting, she will hiss like a snake, and permit any one to catch her, rather than compel her to leave the nest.



Did you ever catch one of them, Papa? Or did you ever see one of them in a cage?

No, Edward. It is not a fit bird for a cage. A periodical publication mentions one that had been winged by a sportsman, and was put into a small cage of oak wood, and wire. During a night and a day, in which he was in captivity, his tapping labour was incessant; after occupying his prison for this short time, he left the wood-work pierced and worn, like worm-eaten timber. He manifested extreme impatience at his situation; he was unremitting in his efforts to make his escape: and in these efforts exhibited much intelligence and cunning. He was fierce, fearlessly bold, and ate voraciously. This bird was particularly laborious, and employed his bill in a manner different to any other bird; "grasping hard with his immense feet, he turned on them as on a pivot, and struck with the whole weight of his body."

There is a bird gliding over us very unlike the nut-hatch, Papa; I think it is the sparrow-hawk.

It is; and one of the most destructive birds we have to young chickens, pigeons, and partridges. It is very common in some districts.

I saw one, some time since, which a young man shot; its feathers are very fine. The tail was marked with black belts. And the legs were much like those of some parrots I have seen; green, yellow, and waxy.

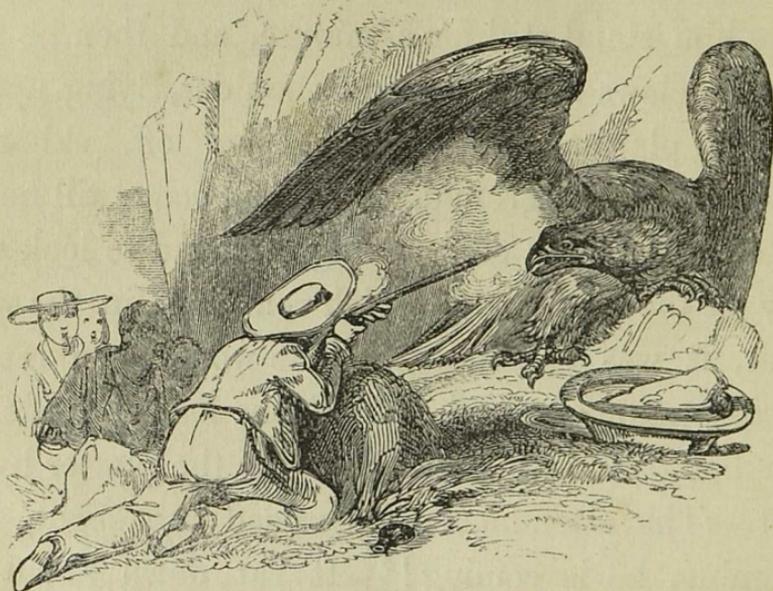
It belongs to the order Accipitres; more than a hundred species have been described by naturalists; it includes in it the eagle and the falcon tribes. Few of them are to be found in Britain. I have sometimes seen, in retired woodland situations, the milvus, or kite, which our Saxon ancestors used to call *glida*, from its gliding along through the air, rather than flying, as other birds do. I have also several times disturbed the butes, or buzzard, in the New Forest.

But, Papa, did you ever see an eagle?

Not in England; I once saw a very large one, when near the Highlands in Scotland. They chiefly frequent mountainous countries, which are but thinly inhabited. Mr. Bruce tells us he met with the golden eagle, which he calls the largest bird that flies on the summit of Mount Lamalmon. He and his servants were refreshing themselves after their laborious ascent,

with some large dishes of boiled goat's flesh. Whilst they were dining, this eagle suddenly made its appearance; "he did not stoop rapidly from a height, but came flying slowly along the ground, and sat down close to the meat, within the ring the men had made around it. A great shout, which they raised, made him stand still for a minute, and then he fixed both his claws into a leg and shoulder, lying upon a wooden platter, and carried them off, skimming slowly along the ground, as he had come, till he disappeared behind a cliff. Being observed to look wistfully at the large piece which remained in the warm water, it was concluded that he would soon return; in expectation of which, Mr. Bruce loaded a rifle gun with ball, and sat down close to the platter by the meat. The attendants soon raised the shout, 'He is coming, he is coming!' It sat down about ten yards from him, the meat being between them. Mr. Bruce fired, and shot him through the middle of his body, so that he dropped on the grass without a flutter. Upon laying hold of his monstrous

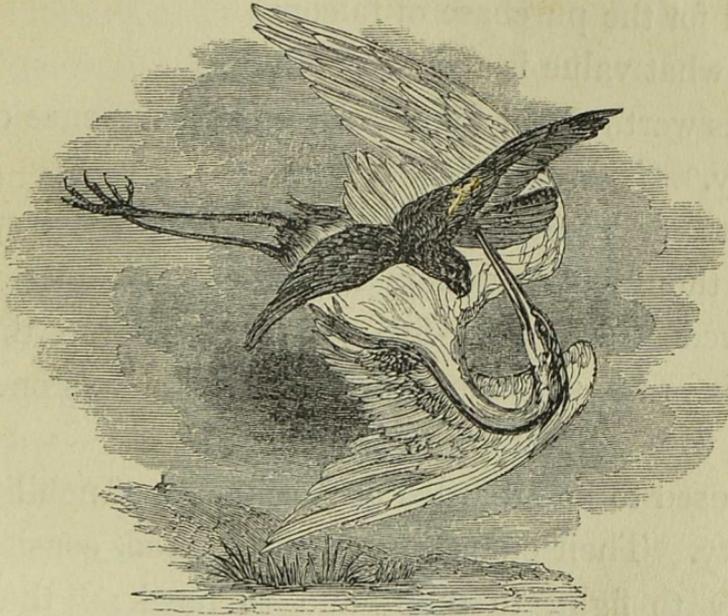
carcase, Mr. Bruce was surprised to see his hands covered with yellow powder." This bird, from wing to wing, was of the enormous size of eight feet four inches; and from the tip of his tail to the point of his beak, four feet seven inches.



What an enormous bird; how I should like to have seen it! Did you not say, that the falcons are of the same order?

They are.

I have read in the History of England, that kings, and great men, in past times, were accustomed to amuse themselves very much with falcons trained so as to be tame, and to catch birds.



Falconry was one of their principal amusements. And the falcon is a surprising bird for the purpose; it will take a few circles in the air, and then dart on its prey with such precision and violence, as to strike off the head, as nicely as if it were done with a razor.

Those of Norway used to be preferred; but the falcons of Iceland are now said to be the best. It is affirmed, that the King of Denmark sends between two and three thousand rix-dollars annually to that island for the purchase of falcons.

Of what value is a rix-dollar?

It is worth about four shillings and sixpence of our money.

Let me see,—then, supposing the king spends three thousand rix-dollars in falcons, it comes to six hundred and seventy-five pounds. Among the old paintings we saw the other day, there was one of a king, with a hawk on his hand.

It used to be regarded as a criterion of nobility, or royalty. Their education, at that period, consisted of ability to fight, to hunt, and to hawk; “they left study and learning, as they said, to the children of mean people;” very little aware of the axiom of Bacon, so well understood in our day, that “knowledge is power.”

And did they give as much for their hawks, or falcons, as the King of Denmark?

Yes, and oftentimes much more. In the reign of James the First, Sir Thomas Moxon gave one thousand pounds for a set of hawks, so high a value was set on them. In Edward the Third's reign, it was felony to steal a hawk; and for a person to take its eggs, even on his own estate, was liable to imprisonment for a year and a day, besides being fined at the king's pleasure. Though in the reign of Queen Elizabeth, the imprisonment was lessened to three months, the offender was to find security for his good behaviour for seven years; or lie in prison till he did.

It would be found very difficult to execute such laws now.

Not only difficult, but impossible; and so it ought to be. Punishments ought to bear some proportion to the greatness of the crime. To make it felony for man to kill a hawk, was tyranny and cruelty, and a mere mockery of the very name of justice.

Did you notice the large bunches of red berries on a tree on the side of the last gate which we passed through, Papa?

I did; they were very beautiful. The tree is the Sorbus, or Service Tree; we call it commonly, the Mountain Ash.

I have noticed it when in blossom; it is covered with large clusters of white flowers, at the sides and ends of the branches; but I forget to what botanical class it belongs; and now we cannot learn from its berries.

True; but it is of the same class with the rose.

Then I know; it is the Icosandria class, the flowers of which have always more than nineteen stamens; and they always stand on the petals, or on the cup of the flower. But what order is it?

It has three pointals.

It must, therefore, be of the third order, or Trigynia.

It is one of the most ornamental trees we have for shrubberies, and pleasure grounds; on account of the numerous clusters of red berries which continue on it through the autumn, and a great part of the winter, till they are eaten by the thrush and the blackbird.

It has been supposed, with some probability, that this tree was a favourite with the Druids; as they are observed to abound in the neighbourhood of the Druidical circles of stones, in North Britain. There are three species of it.

The growth of trees is very wonderful; how do they grow?

Your question, Edward, cannot, perhaps, be altogether answered. In general, we may remark, that the root extracts the principal nourishment from the earth; this vital juice is formed into a quality that hardens into wood, bark, and leaves. There seems to be a circulation going on through every tree, similar to that of the blood in animals. The heat of the sun is the power by which this wonderful liquid is put into action. But the whole process does not admit of explanation. How impossible it is to examine any object around us, without being convinced of the wisdom and power of the adorable Creator. What human genius, however great, could produce the meanest plant, or tree, with its sap, leaves, blossoms, and fruit.

What is that pretty bird which flies along before us in a curve, yellow and brown, and which moves its tail so prettily?

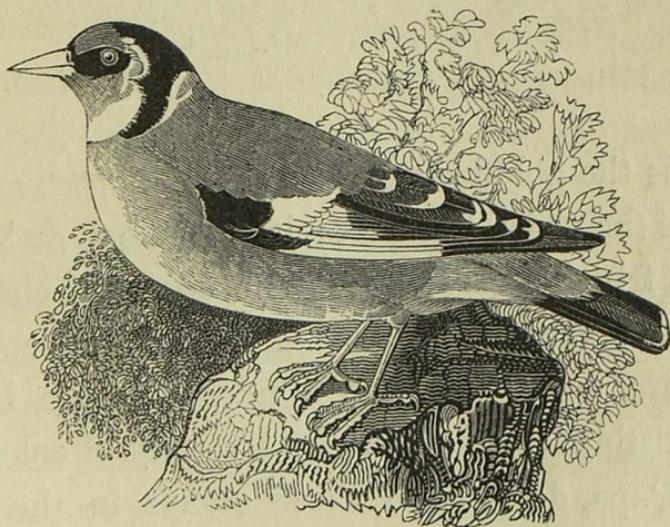
It is a species of the wagtail; it has its name, as is evident, from this singular movement. There are three kinds of them in various parts of Britain. It is of the order Passeres. The bird before us, is the *Motacilla Flava*, or yellow wagtail, which stays in the county of Hants, and in some other parts, the whole year. You see, the breast, belly, and thighs, are of a lively yellow. There are several large black spots on its throat; above the eye there is a line of bright yellow; the head, and upper part of the body are of olive green. The third species is grey.

The tail is a mixture of white and black feathers. But see, there is another; but it has not the black spots on the breast.

True, because it is the hen bird; and her colours are not so gay as those of the male. The *Motacilla Alba*, or the white wagtail, is also a very handsome bird. Its throat is marked with a black crescent;

and the breast and belly are white. Its tail is long, and, like those of the birds before us, always in motion. It is a regular attendant on the plough, since it devours worms, and several sorts of insects, which are thrown up on the surface of the earth by that useful machine.

Do stand still, Papa, a moment, to see that beautiful bird feeding her young ones, on the dead branch of the ash tree; are they not goldfinches?



Yes; and the parent birds are not only feeding them, but they are teaching them to fly, and are about to

take their leave of them for ever. See, how they fly a little way from the branch, and then back again; and how they seem to play about it. Here is the very scene, Edward, which Thomson has so prettily described;—"And now," he says,

* * "the feather'd youth their former bounds,
Ardent disdain; and, weighing oft their wings,
Demand the free possession of the sky.
The parents guide, and chide, exhort, command,
Or push them off. The surging air receives
Its plummy burden; and their self-taught wings
Winnow the waving element."

How is the goldfinch classed?

It is of the order Passeres; its technical, or learned name, is *fringilla carduelis*. The sparrow, chaffinch, linnet, and canarybird, belong to the same order. There are more than one hundred species in this order; distinguished chiefly by a variety of colour.

But, Papa, do you see those clouds in the west? Do they not threaten a storm of thunder and lightning?

I think they do ; though I hope it will not be so dreadful as that of the other evening.

I thought you were pleased with a storm, Papa !

So I am ; it usually fills my mind with sublime emotions of the divine Majesty. And we are as safe in the tempest, under the Almighty's protection, as in the calm, and the sunshine.

Yet I should say of the storm of the evening to which you allude, that it produced some feelings of dread ; it was awfully grand. The fields before our house were not only occasionally lit up with the electric blaze, but they were literally full of fire, and at every moment.

Electric blaze, Papa !

Yes, the clouds were, doubtless, full of electric fluid. The thunder and lightning were the results of the discharge of those clouds. But the electric fire is more or less distributed through the whole of the creation.

Was there not much injury done by that storm ?

Yes, in some districts around us, thousands, and tens

of thousands of panes of glass were broken; and not a few fields of wheat and barley were utterly destroyed by the hail-stones, and pieces of ice, which fell with great force from the heavens. Some of these were several inches in circumference in sheltered places, whither they were driven by the wind; there were many wagon loads lying in a heap, even the next day.*

How sublime do the sacred writers speak of Him, "who rides in the whirlwind, and directs the storm." He arises, the earth trembles, the foundations of the hills are shaken. The clouds are the dust of his feet. The mountains melt like wax, they flow down at his presence. The Most High speaks; the channels of the waters appear; there are hail-stones, and coals of fire. When he came down on Mount Sinai, "his glory covered the heavens; he stood, and measured the earth; he beheld, and drove asunder the nations; the everlasting mountains were scattered; the perpetual hills did bow. His ways are everlasting!"

* This was actually the case in July, 1836, near Downton, Wilts.

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