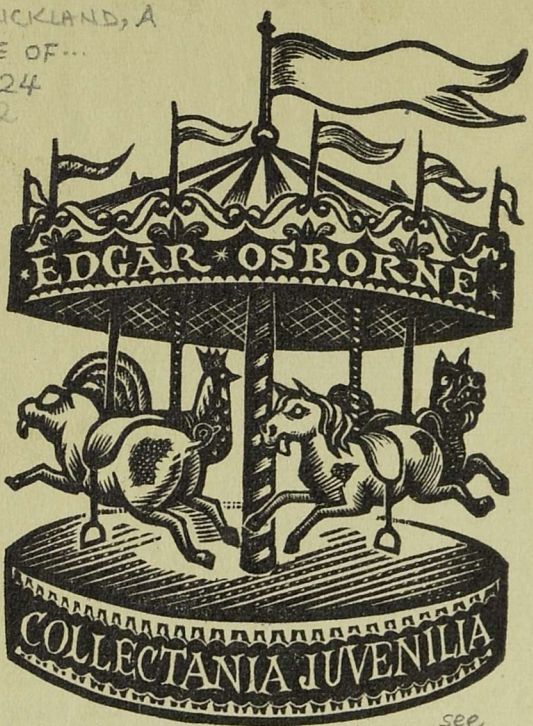

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FRONTISPIECE TO "THE USE OF SIGHT."

"And are you quite sure, my little girl," said Harriet's father, as she closed the book, and looked upon him with a wistful eye,-

see page 9

London: William Darton, 58 Holborn Hill, 1 mo. 2, 1824.

THE

USE OF SIGHT:

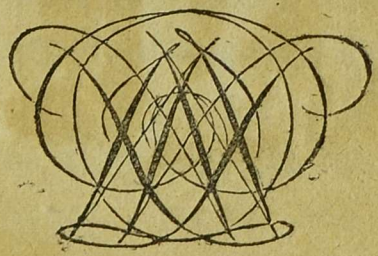
OR,

I WISH I WERE JULIA.

Intended for the Amusement and Instruction of Children.

BY THE AUTHOR OF THE
"MOSS-HOUSE," "YOUTHFUL TRAVELLERS," &c.

WITH COPPER PLATES.



LONDON:

WILLIAM DARTON, 58, HOLBORN HILL.

THE USE OF SIGHT,

&c.

"I WISH I were Julia, for I never saw a lapwing!" exclaimed the rosy Harriet, as she was one morning turning over the leaves of a little book in her father's room.

"Who do you wish to be, my dear?" said her papa, smiling at the disconsolate tone in which she spoke.

"Here is a verse in my 'Original Poems," papa; and such a pretty one! it is called the '*Use of Sight.*' A boy and a girl, named Tom and Julia, went a

walk together, and saw such a number of pretty things—things that we never see when we walk: they saw misseltoe, papa, with shining white berries,—to be sure, I cannot tell what misseltoe is, but I dare say it is something I should like to see;—and a wood-pecker, papa,—and starlings, and swallows, and martins,—and a king-fisher, with such bright feathers, —and a heron, and a lapwing; this lapwing pretended to be lame to decoy them from its nest.—What does that mean? Oh, I wish I had been that happy Julia! When we walk, Mary always takes us the same way, along that tiresome London-road, or backwards and forwards on the terrace,

and we see no birds there, except some sparrows picking up insects on the ground, and the rooks flying about the tall elm-trees at the end of the terrace, and making the same disagreeable noise day after day,—but we never see any thing new, neither lapwings, nor kingfishers, nor woodpeckers!"

"You laugh, papa; but what Harriet says is quite true;" said Paul, who had been listening to his sister: "we see the church-spire peeping, just the same as ever, among the poplars, and we meet the same people again and again when we walk, but, as to *new* and interesting objects, they never occur!"

"Oh, how delightful would it

be if you would walk with us, and talk to us, and point out what was worthy of notice, as Tom and Julia's papa did," said his sister.

"Who were *Tom* and *Julia?*" enquired Mr. Carlton, smiling. "Let me hear the tale, Harriet."

"Shall I read it then, papa?"

"Yes, my love."

(Harriet reads:)

THE USE OF SIGHT.

"What, Charles returned!" papa exclaimed,
How short your walk has been!
But Thomas, Julia,—where are they?
Come, tell me what you've seen."

"So tedious, stupid, dull, a walk!"
Said Charles, "I'll go no more;
First stopping here, then lagging there,
O'er this and that to pore.

"I cross'd the fields near Woodland House,
And just went up the hill;
Then by the river side came down,
Near Mr. Fairplay's mill."

Now Tom and Julia both ran in,
"O, dear papa," said they,
"The sweetest walk we both have had,
O, what a pleasant day!

"Near Woodland House, we cross'd the fields,
And by the mill we came."
"Indeed!" exclaimed papa, "how's this?
Your brother took the same.

"But very dull he found the walk:
What have you there? let's see;—
Come, Charles, enjoy this charming treat,
As new to you as me."

"First look, papa, at this small branch,
Which on a tall oak grew,
And, by its shining berries white,
The misseltoe we knew.

"A bird all green ran up a tree,
A woodpecker we call,
Who, with his strong bill, wounds the bark,
To feed on insects small.

"And many lapwings cried peewit!
And one, among the rest,
Pretended lameness, to decoy
Us from her lowly nest.

"Young starlings, martins, swallows, all
Such lovely flocks so gay;
A heron too that caught a fish,
And with it flew away.

"This bird we found, a kingfisher,
Tho' dead, its plumes how bright,
Do have him stuffed, my dear papa,
'Twill be a charming sight.

"When reached the heath, how wide the space,
The air how fresh and sweet;
We plucked these flowers and different heaths,
The fairest we could meet.

"The distant prospect we admired,
The mountains far and blue;
A mansion here, a cottage there:
See, here's the sketch we drew.

"A splendid sight we next behold,
The glorious setting sun,
In clouds of crimson, purple, gold,
His daily race was done."

"True taste and knowledge," said papa,
"By observation 's gained;
You've both used well the gift of sight,
And thus reward obtained.

"My Julia in this desk will find
A drawing-box quite new;
This spy-glass, Tom, you've oft desired,
I think it now your due.

"And pretty toys and pretty gifts
For Charles, too, shall be bought,
When he can see the works of God,
And prize them as he ought."

"And are you quite sure, my little girl," said Harriet's father, as she closed the book, and looked upon him with a wistful eye,—"are you quite sure that you have observed every thing worthy of notice that occurs in your daily walk up and down the London-road?"

"Quite sure, papa, as I told you before,—the sparrows picking up worms in the road, and the rooks calling out caw, caw, caw,—and the spire, and the poplars,—nothing else—nothing particular, I mean."

"So you think it is really possible to walk for a mile up and down the London-road without seeing any thing but sparrows,

and rooks, and poplar-trees, and a church spire! I fear, my dear Harriet, you have sometimes walked with your eyes shut."

"No, indeed, indeed, papa—there is really nothing worth looking at—nothing particular,—neither lapwings nor kingfishers."

"What! then, are lapwings and kingfishers the only objects worthy of notice?"

"Ah, papa, you are laughing at me, but, if you had walked day after day up and down that tiresome London-road, I really believe you would have become as weary of it as I am, and would never have found any thing new to amuse you."

"Perhaps neither lapwings nor

kingfishers," said Mr. Carlton; "but I assure you, my dear Harriet, that, if I were compelled to walk up and down that tiresome road, as you are pleased to term it, every day for a month, or for a year, if you like, that I should still find something novel, something to please, or something to instruct."

Nature is full of beauties, would we but exercise the habit of observation, and take notice of every thing that is to be seen around us:

"Blows not a flow'ret in the enamelled vale,
Shines not a pebble where the rivulet strays,
Sports not an insect on the spicy gale,
But claims our wonder and excites our praise."

We should accustom ourselves

to make observations, and not allow any thing to pass unregarded or unnoticed; for, not a single landscape is devoid of interest, to those who are fond of Nature. Look at a corn-field: what an object of interest is there presented! In the Autumn the seed is sown in the ground, where it remains during the winter, being preserved from the frost by a thick covering of snow: in Spring it begins to bud; and, by degrees, emerges above the earth: the wheat looks green at first, like grass, but it grows larger and larger until it attains its full size, and is crowned with a perfect ear; then it turns yellow, and becomes ripe. When in this state, men and

boys are employed to reap it; they cut it down with their sickles, and tie it up into sheaves, which are placed in the middle of the field for the sun to ripen them: when dry, these sheaves are put into large waggons, and carried to the barns, where they are placed in heaps, and thrashed with an instrument called a *flail;* the husks of the wheat are called *chaff,* and the wheat itself is taken to a mill, where it is ground into flour; and of flour, bread, and puddings, and pies, and cakes, are made. Little reader! let me beg of you never again to pass a corn-field without thinking of the goodness of God, who causes the seed that is sown in the ground to spring

up, and, in the Autumn, to bring forth fruit.

Look at an orchard! The trees bend down beneath their heavy weight; their branches are loaded with ripe and beautiful fruit. You see large heaps of apples under some of the trees; they are collected together by the people to whom the orchard belongs, in order to make cyder:—the juice of apples is called cyder, and cyder is a very useful liquor; it is cool and refreshing: the poor haymakers, weary with toiling under a hot sun, are often refreshed by a draught of cyder. All these apple-trees were produced from those little pips or kernels which you must have seen

if you ever cut an apple in two. How wonderful! a whole orchard of fine large apple-trees may be raised from the pips or kernels of half a dozen apples!

Look around you again! Take a survey of some large wood. What a variety of trees it contains! elms towering upwards into the sky, wide-spreading beech-trees, and chesnuts, and hazels, and oaks:—only think of the oak; what a fine large tree it is, with its rugged trunk and its numerous branches, and yet every oak was once an acorn! a little acorn!

"The oak, for grandeur, strength, and noble size,
Excels all trees that in the forest grow;

From acorn small, that trunk, those
branches rise,
To which such signal benefits we owe.

"Behold what shelter in its ample shade,
From noon-tide sun, or from the
drenching rain;
And of its timbers staunch vast ships are
made,
To bear rich cargoes o'er the watery
main."

What a variety of interesting objects may be seen in a common walk, would we but exercise our thinking powers and look around us; would we but exercise the habit of observation, and take notice of all that is to be seen! Not a cloud, not a leaf, not an insect, not a pebble, nor a flower, but might become the source of some interesting enquiries.

Harriet, however, could scarce-

ly be convinced that her daily walk up the London-road could present any thing new; and her father, in order to convince her of the truth of our statement,—that is, that in the *simplest* objects are things of interest to be found,—determined to bring it to a practical proof.

"If you will put on your hat, my love," said he, "we will endeavour to exercise the *Use of Sight.*"

Harriet jumped and capered about the room for joy when she heard this, for she had seldom walked out with her father; and Paul, participating in her pleasure, begged to accompany them. The little straw-hat of the former

was presently found; and, being furnished with a small basket, which, at her father's request, she took in her hand, they proceeded along the terrace that led to the London-road. This road was bordered on each side, for about a mile from the town, with high elms, and, although of considerable width, their branches nearly met over-head. There were posts and chains on one side of the road, that separated it from the causeway or foot-path, which was somewhat elevated, and a green sloping bank lay between it and the road; and, on the other side, was a quick-set hedge, beyond which were corn-fields and hay-fields, and beautiful prospects of

a richly-wooded country, interspersed with cottages and hamlets. On the opposite side of the road was a small river, sometimes gliding rapidly along in a straight direction, and sometimes winding in a serpentine course and forming a small peninsula, then again rejoining the road at the distance of a few hundred yards. There were some cottages built along near the banks of the river, and they had small gardens before them full of pretty flowers; and, a little further on, there was a bridge across the river, and the river itself became wider, and little boats might be seen plying about it in various directions, for there was a coal-wharf upon its banks, and

numerous coal-barges might be observed moving slowly up the canal that joined it at this spot. A little further on was a brick-yard; and, beyond the brick-yard, there were green fields and woods again, and then a gentleman's park, bounded by Chinese paling. This is a concise description of the road that Harriet thought so dull—so tedious—and so tiresome! The fact is this:—Harriet, not having been in the habit of walking with her father, or with some intelligent friend, who could reply to her enquiries, and give satisfactory answers to her questions, had not habituated herself to *think* of, nor indeed to observe, the various objects of interest on the road: she

noticed the rookery, because it formed a boundary to the daily walk in one direction, and the church-spire, among the tall poplars, because it formed a boundary to the view in the other direction, and pointed out the termination of the walk, which had, hitherto, too frequently been considered as a task, rather than as an event productive of pleasure. Let us see what a change took place in one morning.

Our little party had not proceeded far before Mr. Carlton stopped at a gap in the quick-set hedge already mentioned, and seemed to be looking intently at something hid among the branches of the hawthorn.

"What are you looking at there, papa?" enquired Paul.

"At some little glittering network," said Mr. Carlton, smiling.

"*Glittering network!* what does papa mean?" said Harriet. "May we look?"

"Most assuredly you may."

"Ah! ah! now I understand: a spider is spinning himself a web between those two little twigs, and you call the web glittering network, because the sun shines on it, and it sparkles; the dew has bespangled its fine threads, and made every part of it appear beautiful: it looks like very fine silk. I think, papa, that this Mr. Spider of your's is a very clever little animal."

"That he undoubtedly is," said Mr. Carlton.—"Now, observe how he will manage with that poor little gnat which is this moment caught in the toil."

"Oh, papa, I did not see the gentleman himself before: there, there he is, darting from his secret abode, along the delicate lines, just as a sailor would slip down a rope. There! he has seized his prey and has made a hearty meal of it."

"Now, wait a moment and see what he will do next;" said Paul's father.

The children had not watched long before another fly became entangled in the net; the spider waited patiently until it was tired

of trying to gain its freedom, and then, rolling the web around it, he left the poor little thing, in a somewhat pitiable condition, as food for a future meal. Paul and his sister made many remarks upon the cruelty and ingenuity of the animal.

"And now I suppose," said the latter, "that he will begin to spin a new web:—there! I thought he would; he is beginning already. How quickly he moves! May we not stay and see him complete his work?"

"I think we had better continue our walk now," said her father; "but, as we return, we can observe the progress that has been made during our absence; we shall

know the exact spot by this gap in the hedge. Now tell me, Harriet, whether the tiresome London-road has not produced *one* novelty ?"

"Yes, papa: I never saw a spider spinning its web, its curious little web, before."

"And yet there are, no doubt, hundreds of spiders spinning their webs between the numerous branches of this hawthorn hedge every day;" said Mr. Carlton. "This is one proof that you have neglected the *Use of Sight*. We may learn something even from a spider; industry and perseverance, if nothing more. The spider would not gain a sufficient quantity of food to support himself, if

he had not perseverance enough to spin another web as often as he has destroyed one by taking his prey; but the webs of spiders have been, I am told, applied to another use as well as that of catching insects.'"

"What is that, papa?"

"Can you tell me what your spenser is made of, Harriet?"

"My spenser, papa! you cannot mean that it is made by a spider!—it is made of silk—blue silk."

"What is silk?" said her father.

"Indeed, I do not know; I was never told; I never before considered what silk was."

"The silk of which your spenser is made was not spun by a

spider, certainly," said Mr. Carlton, "though by a little insect not much exceeding it in size:—a little insect not unlike a drab-coloured caterpillar, termed a silk-worm, which does not live in England, but in warm countries a great way off, called Italy, China, Persia, &c. where its labours form a considerable article of commerce. Its food is the leaves of the mulberry, in which tree it generally lives; it winds itself in a silky web, which it attaches to one of the leaves; these little webs, called *cones*, look extremely pretty when they hang in thousands among the leaves of the trees in a mulberry-grove; they are collected together in immense numbers by

people employed for the purpose, and the silk that is wound off them, after slight preparations, is spun into thread by means of machinery in silk mills, which thread, the weaver, or man whose business it is to weave, converts into various elegant fabrics. You look astonished, but it is actually true:—your mamma's gown—your own spenser—the silk curtains in the drawing-room at home, are all the produce of little insects no bigger than caterpillars. And now I am going to tell you something quite as wonderful! whatever man, ingenious man, can spin into thread, he contrives to weave into garments, and in this respect Nature alone has fixed

the bounds to his materials, for about seventy years ago a French gentleman, named Mr. Bon, actually contrived to manufacture from the *spider's web*, a pair of stockings and mittens of a beautiful natural gray colour, which were almost as handsome and strong as those made of common silk."

"Seventy years ago! that is a long time. Why do they not bring the spider's web into general use?" said Paul.

"Because," said Mr. Carlton, "the natural fierceness of spiders renders them unfit to be bred and kept together. You know that it would have taken too long a time for Mr. Bon to pretend to go from one shrub to another to collect such an amazing quantity of webs

as would be needful, so he distributed four or five thousand spiders into cells, fifty in some, and one or two hundred in others, but the big ones soon killed and eat the little ones, so that in a very short time there were scarcely felt more than two in each cell. This is one reason why the plan did not succeed, and another reason is that the silk of the spider is much finer than that of the silkworm, and that a much greater quantity would therefore be required; for the work of twelve spiders only equals that of one silkworm:— these seem strong objections, but certain it is that a pair of stockings have been actually made of this delicate material."

"I like all that you have told

us about the spider, very much, papa," said Harriet. "I wish you would tell us something more; I never intend to be afraid of a spider again."

"There are more than fifty different sorts of spiders," said Mr. Carlton; "one of the most remarkable of these is the water-spider; and, when I have described it, we will turn our attention to something else; as I wish to convince Harriet that there are innumerable objects of curiosity to be found on the "tiresome London road," for those who choose to exercise the Use of Sight.

"The water-spider may be termed amphibious—"

"What do you mean by that long word, papa?"

"*Amphibious* animals are those which are able to live either on the land or in the water. Frogs are amphibious; so are serpents, and seals, and white bears, and there are some sorts of birds and insects that are amphibious, among which may be placed the water-spider, for it can live on land as well as in the water, and frequently comes on shore for its food; yet it swims well, and is distinguishable by its brightness. In the water, the under part of it appears covered with a silver varnish, which is only a bubble of air attached to it by a sort of oily juice, which transpires from its body, and prevents the immediate contact of the water. This bubble of air is made the substance of

its dwelling, which it constructs under water; for it fixes several threads of silk, or such fine matter, to the stalks of plants in the water; and then ascending to the surface or top, thrusts the hinder part of its body above water, drawing it back again with such rapidity, that it attaches underneath it a bubble of air, which it has the art of detaining under water, by placing it beneath the threads which it binds like a covering almost all around the air-bubble. Then it ascends again for another air-bubble, and thus proceeds until it has constructed a large aërial apartment under water, which it enters or quits at pleasure. It lodges

during the winter in empty shells, which it dexterously shuts up with a web.

"All these curious contrivances, Harriet, would for ever have been unregarded, had not our naturalists exercised the Use of Sight:—a faculty which even gratitude alone, to the Giver of every blessing we possess, should induce us to put into practice."

Our little party now proceeded along the footpath; and, before they had gone far, they passed a stile which led from the high road into a field, but which was so low that it was almost impossible to pass it without seeing what was growing in the field.

"Have you ever looked at

this field before?" said Mr. Carlton stopping short before the stile. "Have you ever noticed these elegant blue flowers?"

"Oh yes, to be sure, papa, I have just seen that there are blue flowers growing in this field, but then I never thought any thing about them, except that they were common blue flowers. I am not sure, but I rather think Mary once told me that they were called *flax;* this, however, did not make me any the wiser, for I do not know of what use flax is."

"Perhaps you can tell your sister, Paul," said Mr. Carlton.

"I, papa!—I really don't know! —oh, I recollect!—I think I have heard somebody say that linen is

made of flax, but I, for my part, never knew before that the plants in this field were the same that linen is made of."

"Linen made of blue flowers like these!" exclaimed Harriet. "Oh, Paul! you are only in play! Papa, do you hear what my brother says?"

"Paul is perfectly right," said Mr. Carlton. "Linen is made of flax, and the flowers in this field are *flax*. Jump over the stile and gather one of them, my dear boy."

Paul did as his father had desired him.

"The stalk of flax is of a fibrous texture, Harriet," said Mr. Carlton; "and, when I have given you some little account of the process

it has to undergo before it can be transformed into linen, I think you will acknowledge that this is no greater an impossibility than for the web of a little insect to be fabricated into spensers and gowns."

"Do tell us something about it, papa," said both of the children in a breath.

"As soon as possible after the flowers appear in full blossom," said Mr. Carlton, "they are pulled up, gathered into handfuls, and placed about the field, that the sun may dry them. When perfectly dry, the operation called *rating* takes place."

"What is that, papa?"

"Rating of flax is steeping it in water, in order to loosen its bark

or rind," continued Mr. Carlton. "The fibrous part of the stalk is all that is to be used, and therefore the first thing to be done is to separate the rind or outside part from it. For this purpose, the bundles are laid in a shallow pond, or ditch, and soaked there for five or six days, until they are perfectly soft, and can be easily separated."

"Then, what is the next process?"

"When taken out of the water, the bundles are spread out again in some warm place, where they will dry quickly, and are then ready for the *braking*, which is the second operation they go through before they are transformed into linen. This is performed by means

of a long wooden instrument, full of notches, which is used to break them into pieces, or, more properly, to separate the fibres of the stalks from each other. When the flax has been sufficiently beaten, it has to be *hackled* or combed until all the long fine fibres are made smooth or even, and they are then ready to be spun into thread ; this thread is wove into linen by the weaver, and thus the useful material called linen is the product of a little and comparatively insignificant plant, which you, my dear Harriet, have so often passed unnoticed. Oh, what a happy thing is it to possess the habit—the necessary habit—of observation !"

As Mr. Carlton spoke, they pas-

sed the coal-wharf, and he, anxious to prove to his little girl the various sources from which useful information might be gained, pointed to a barge, which, heavily laden with coal, was moving slowly along the canal.

"Can you tell me what coal is?" said he.

"Coal," said Harriet, laughing, "yes, we use coal to make fires—fires are made of coal."

"But that is not telling me *what* coal is," said her father. "Cannot you tell where it comes from?"

"I think Mary said it came from Birmingham."

"But where is it found? what is it?—an animal, a vegetable, or a mineral?"

"Not an animal, certainly!" rejoined Harriet; but here she paused, as unable to proceed.

"Nature—" said Mr. Carlton, "all natural productions are divided into three parts, called *kingdoms*: the animal, the vegetable, and the mineral kingdoms. Now, can you give me an example of something that belongs to the animal kingdom?"

"Men, and women, and little girls."

"Very well: now name something that belongs to the vegetable kingdom: —all vegetables grow, you know."

"Trees, and shrubs, papa; rose-trees, elms, and snow-drops."

"Very well: now for the mi-

neral kingdom; minerals neither grow nor live, they are found in the ground, dug out of the earth."

"Then stones must be minerals; and coals, I believe, must be minerals, for they neither grow nor live."

"You are right; coals are combustible minerals."

"Combustible, papa!"

"Yes; *combustible* signifies *what will burn:* coals will burn; therefore, coals are combustible."

"All minerals, that is, all things, that are dug out of the earth, are divided into four classes. Do you think you can remember their names if I repeat them to you."

"I will try, papa."

"All minerals," said Mr. Carlton

again, "that is all earths, soils, stones, and metals, are divided into four classes :

1. *Earthy* minerals—being all such as are without taste and smell ; as flint, clay, sand, &c.
2. *Saline* minerals—being such as have a salt taste, and are heavier, softer, and partly transparent, as salt itself, alum, and salt-petre.
3. *Inflammable* minerals—being lighter, brittle, opaque, and never feeling cold; as sulphur, &c.
4. *Metallic* minerals — being heavy, opaque, cold, ductile, or capable of making wire ; and malleable, or capable of being worked into shape, such as gold and silver, lead and copper.

"Now, to which of these classes do coals belong ?"

"I believe, inflammable means combustible," said Harriet; "but I do not know what you mean by saying that inflammable minerals are *opaque*."

"Can you see through glass?" said Mr. Carlton.

"Yes, papa, certainly: you know we have glass windows, that we may see through them, and that they may let in the light."

"Glass," said Mr. Carlton, "is *transparent*; whatever we *can* see through is called transparent: *opaque* is the contrary of transparent; whatever we *cannot* see through is called opaque."

"Then coal is an opaque and combustible mineral," said Harriet. "I have learned something to-day, papa; for, although I have passed by this wharf a hundred times, I never before thought about coal."

"You will think of it more fre-

quently now, I hope," said her father ; "coal is one of our most useful minerals, and badly off indeed should we be without it. In some countries, where the people are too poor to buy coal, they burn peat, and turf, pared from the surface of those wild wastes called commons : in other countries, among the Highlands of Scotland, for instance, they burn a plant called heath, which grows in abundance upon their wide moors, and supplies the poor people, not only with firing, but also with thatch for their cottages, and materials for their bedding ; it is a little sturdy plant, bearing an elegant red blossom, and, if you had but *walked with your eyes open*, you

would have seen abundance of it upon the common about half a mile further on. However, *we* are able to procure coal, and I think we ought to be very thankful that we are so well off. When the cold and dreary winds of winter are blowing around our dwellings, we should think it a sad thing to be compelled to warm ourselves by a little peat-fire;—and yet, how many are destitute of the comforts we possess! how many are obliged to do so!"

During this conversation between Harriet and her father, Paul had run on to look at some men who were at work in a stone-quarry not far off, and he now returned, bringing in his hand what

he called, and what the men also called, *curiosities*.

"I have often looked in that quarry, father," said he, as he advanced towards Mr. Carlton, "but I never found any thing curious in it before. I thought, —I mean, I used to think,—that it was only a free-stone quarry, and that there was nothing very particular in it. While I was looking about, however, I found this curious thing, which looks like a shell made of stone, and one of the workmen had a great number of them, which he had collected for a gentleman who is fond of such things; and here is another curiosity, which looks more like a snake coiled up than any thing else."

"These," said Mr. Carlton, "are petrifactions; they were originally shells, or animals, but have probably been in their present state many hundred years."

"What are petrifactions, papa?"

"Petrifactions are bodies, or substances, either animal or vegetable, wearing the appearance of stone, and are frequently found at different depths beneath the surface of the earth, appearing in the exact form of the objects they represent."

"Then, do you think this was ever a real shell, papa? It looks just like a cockle. Do you think it was ever a sort of cockle?"

"Unquestionably," said Mr. Carlton. "It has probably lain

many centuries under-ground ; in consequence of which, the solid parts have decayed, and stony particles have filled up their vacancies, and transformed the original into stone, or, at least, given it the appearance of stone. This wonderful process is called petrifaction."

"But this stone-quarry is a long, long way from the sea, you know, papa, for it is in one of the midland counties of England: by what means could sea-shells ever come into it?"

"I consider such petrifactions as a proof of the truth of the universal deluge, when the waters covered the earth, and, as they subsided, left a great number of

shells and other marine substances behind them, which, becoming petrifactions, are now evident proofs of that awful event. The shell you hold in your hand has probably been in that quarry since the time of the flood."

"I wish I might go into that stone pit, and look for some petrifactions," said Harriet.

"We shall come to another presently," said her father, "where we shall probably find some."

The children walked on, and the conversation turned upon petrifactions.

"The process by which Nature converts a piece of wood, or a shell, or an animal, into stone; or, to speak more properly, by which

she substitutes a stony deposit in its place, is called petrifaction," said Mr. Carlton, "and the piece of wood, the shell, or the animal, that has undergone this change, is called a *fossil*. Besides this process of petrifaction which is being carried on under-ground, it is discovered that every kind of water carries with it some calcareous or earthy particles, which in time encrust any bodies immersed in it, with a crust over the whole, which takes the exact form of the outward or external figure, and this also is called, though perhaps incorrectly, petrifaction."

"But what a long, long time it must take for any body to be perfectly encrusted," said Paul;

"for, you know, papa, that water is generally clear, and we do not see any of the earthy particles you speak of, which must of course be very minute; it must take a great number of years to encrust even a little shell!"

"It is a question of great importance among naturalists," said Mr. Carlton, "to know the time which Nature employs in petrifying various bodies. It was the wish of the late emperor, duke of Loraine, that some means should be taken for deciding this interesting question. Some naturalists who had long been desirous of an opportunity of making a research, which might throw some light upon the subject, informed the

emperor, that, by the unanimous observations of modern historians and geographers, certain pillars which are actually seen in the Danube, in Servia, near Belgrade, were the remains of the bridge which the Roman emperor Trajan constructed over that river. He rationally concluded that these pillars having been preserved for so many ages, must be petrified, and that they would furnish some information with regard to the time which Nature employs in changing wood into stone. Thinking the hope well founded, and wishing to gratify his curiosity, he ordered his ambassador at the Court of Constantinople to ask permission to take up from the

Danube one of the pillars of Trajan's bridge. The request was granted, and one of the pillars was accordingly taken up; from which, it appeared that the petrifaction had advanced only three-fourths of an inch, in the space of one thousand five hundred years! There are, however, some waters which contain a much larger deposit of calcareous particles than others, and the time that is taken in encrusting or petrifying a substance, would be in proportion to this circumstance."

Both Paul and his sister were much interested in hearing about petrifactions, and the latter wondered why she had so often passed this stone quarry without even

Several girls, with knives in their hands, were cutting up the flowers, and placing them in a sort of hamper.

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thinking of its contents. At last they came to another, but Harriet's attention was presently engrossed by a different subject, and she quite forgot the petrified cockles: this was a forsaken quarry, and the stones it contained were overgrown with lichens and weeds, and wild straggling plants; among the rest, there were a quantity of tall yellow flowers, about three feet in height, the blossoms of which bore a little resemblance to mignionette, and grew in long loose spikes at the end of the branches, or stem. Several girls, with knives in their hands, were cutting up the flowers, and placing them in a sort of hamper. Harriet's curiosity was immediately excited,

and she begged to know what was the name of this flower, and for what purpose the girls were gathering it.

"This plant is commonly called *woad*, or dyer's weed," said Mr. Carlton, "and is cultivated for the use of the dyers."

"The dyers, papa!—who are they?"

"People whose business it is to dye cloths of various colours are called *dyers;* you know that, when flax is first spun into thread, and that thread wove into cloth, the cloth is of a brownish colour, the natural colour of the stalks of the flax; therefore it is necessary that it should be soaked in some liquid of a peculiar colour, in order

to change that appearance; and this process is called dying. The plant which grows so abundantly in this stone quarry communicates a beautiful yellow colour to silks, and linen and woollen cloths; and these children are, no doubt, collecting it for that purpose. The plant becomes perfectly yellow when it is dry, and the whole of it, but especially the seeds, are used for dying."

"Then, are the cloths I have sometimes seen on your horses, papa, when Tom has been leading them out in the morning, dyed with woad?—but I believe they are not entirely yellow; I think they are chequered with blue:" said Paul.

"The wool of sheep forms one of the most valuable and useful of the native manufactures of England," said Mr. Carlton; "the fleece or wool, when it comes from the animal, is first picked and sorted, and then cleaned from stains, dirt, or grease. The woolcomber afterwards prepares it for the spinner, who twists it into woollen thread, called *worsted*, or *yarn*; though, of late years, the twisting has been performed by worsted mills, on the same plan as cotton mills, which do not require so much manual labour. This yarn, or worsted, is then dyed, by the dyer, of any required colour, blue or yellow for instance; and then wove in a loom, into

cloths of various degrees of fineness, according to the fleece, and to the purpose for which it is designed. Yellow worsted is dyed with woad, and blue worsted is dyed with indigo: and thus the horse-cloths, which Tom uses, are composed of worsted dyed with woad and indigo. You see there is scarcely any natural production but may be brought into use in some way or other; even these wild, straggling, yellow flowers, which commonly go by the name of weeds, have their value, on account of the peculiar property they possess. Nothing like observation, my dear Harriet; I dare say, you never noticed this dyer's weed before; and that you, Paul,

never before considered how horse-cloths were made!"

"I think I have heard mamma say that the carpets in the parlours at home are made of wool," said Paul; "though, to be sure, I never thought much about it before; I intend to think a little more in future, papa."

"A very wise resolution," said Mr. Carlton, smiling, "and one to which I hope you will strictly adhere. As I have said already, the wool of the sheep forms one of our most useful articles of clothing, and, when manufactured, one of our most valuable articles of commerce. Not only carpets and horse-cloths are made of wool, but blankets, stockings, flannels

stuffs, and the cloth with which our coats are made, are all the product of the useful sheep."

"And the lamb's-wool tippet, which mamma knit for me last winter, papa," said Harriet.

"Yes, my dear, your *lamb's-wool* tippet may be numbered with the rest of the various articles of clothing, with which this animal supplies us. England and Wales, feed thirty-six millions of sheep, each of which yields a fleece of four pounds weight, or one hundred and forty-four millions of pounds, at one shilling per pound, value seven millions four hundred thousand pounds. These manufactured, produce twenty millions, leaving a profit of upwards of

twelve millions per annum to the manufactors; so you may have some little idea of the incalculable value of this commodity, to which indeed we are so accustomed that we are too apt to enjoy the convenience and comfort it affords, without reflecting upon the source whence it is produced, or feeling sufficiently grateful for it."

"You said just now, papa," said Paul, "that worsted was dyed blue with indigo, and that there was scarcely any natural production but might prove useful in some way or other. Is indigo a natural production?"

"Yes," said Mr. Carlton, "it is procured from a tall shrub, which bears papilionaceous or pea-

shaped flowers, and is chiefly cultivated in the East Indies and in the warm parts of Asia."

"Pray, papa, what part of the plant is used? I have a little cake of indigo in my paint-box, but I had never any idea before that it was procured from a plant."

"When people wish to procure the indigo," said Mr. Carlton, who was ever willing to give his children an opportunity of gaining useful information, "they cut down several whole plants, and lay them in water, in a large shallow wooden vessel. In the course of a few days, as the plant decays, the water becomes discoloured, and, on being drawn off, a blue sediment is found in the tub,

which, when formed into small lumps and dried, is the substance called indigo, of a most beautiful blue colour."

"Thank you, papa;" said Paul.

"I never enjoyed a walk so much in my life before, as I have done this;" said Harriet. "How kind, and how good, you are, dear papa, to allow us to walk with you. I do not think I shall ever call this road dull and uninteresting again; for, if *you* are not with us, when we are walking, we can seek for fresh objects, and tell you about them, when we reach home."

"I am glad to hear you have enjoyed yourself, although you have seen *no lapwing!*" said Mr. Carlton. "I wished to convince

you that every object, trifling and insignificant as it may seem, may present something worthy of notice to the enquiring eye."

Just as he spoke, they passed over a little rustic bridge, that led across the river into a field, along which there was a foot-path for some way, and then the path again re-entered the road. At the moment the children were crossing the bridge, their attention was arrested, and a shout of exultation was heard,—a beautiful bird darted from under the arch, and was gone in a moment: the colour of the crown of its head, and of its wings, was of a deep blackish green, spotted with bright azure; the back and tail were of a

most resplendent blue; the whole under-side of the body was orange-coloured; and a broad mark of the same hue passed from the bill beyond the eyes.

"A kingfisher! a kingfisher!" exclaimed Mr. Carlton. "Now, my little Harriet, I suppose you no longer wish to be *Julia*, for you have actually seen one of the objects with which she was so much delighted."

"But it was gone so quickly," said Harriet, "that I had scarcely time to discover its beauty, before it was out of sight. Will you allow us to stay a few minutes, papa? and perhaps we shall see another; perhaps another little creature will dart from under the arch;

—I suppose they come to the river in search of fish. Does the king-fisher eat fish, papa?"

"Yes," said Mr. Carlton, "as its name implies; though, from its diminutive size, its slender short legs, and its beautiful colours, no one would suppose it one of the most rapacious little animals that skims the deep; the quantity of small fish it will devour is astonishing; they, indeed, form its principal food; and its singularity of catching them is such, that I am sure you would be gratified in observing it: we will stay a quarter of an hour, to see whether one will make its appearance again."

The children leaned on the rail of the bridge, and waited in pa-

tient expectation. At length another beautiful little creature, whose plumage seemed sparkling in the sun-beams, with gold and azure, was perceived waiting with fixed attention, on the low branch of a willow that hung near the water, for the approach of some fish, which should be so unfortunate as to swim that way; presently a poor little gudgeon happened to pass beneath the impending bough, and the king-fisher, ever on the watch, darted with amazing rapidity on its prey, seized it cross-wise in its bill, then retired to a higher branch of the willow, which served as a resting-place, to feast on it; which it did piecemeal, bones and all, as a hawk

would devour a little bird. When this operation was over, the beautiful little creature left its green canopy, and was seen for some time hovering over the water, where a shoal of small fish were playing near the surface, but at length it took alarm at some slight noise which Paul made, and flew away. The children were highly delighted with the sight of the kingfisher,—a bird they had so long wished to see; and they begged their father would try to procure one, and have it stuffed for them.

"It would be a charming sight, indeed, my dear papa," said Harriet.

"What sort of nests do kingfishers build, papa?" enquired Paul.

"Their nests are very seldom found," said Mr. Carlton; "so seldom indeed, that some naturalists have supposed they have none at all, but lay their eggs upon the bare ground; I have heard, however, that one was once discovered in the hole of a bank, by the side of a river, composed of fish-bones; but I do not consider this circumstance as a sufficient reason to believe that their nests, if they have any, are generally constructed of such very singular materials."

"But the nests of some birds are made of things quite as curious, I think, papa," said Paul. "You know the martins that built under the eaves of our house, in the spring, made their nests of

little bits of mud cemented together; and the fly-catcher that built its nest in that hole behind the grotto, had covered it round, and mixed the straw of which it was made, with cobwebs."

"Every nest," said Mr. Carlton, "whether it be that of the fly-catcher, the martin, or the king-fisher, is equally worthy of our observation."

"It wins my admiration
To view the structure of this little work,
A bird's nest: mark it well, within, without;
No tool had he that wrought, no knife to cut,
No nail to fix, no bodkin to insert,
No glue to join; his little beak was all,
And yet how neatly furnished! What nice hand
With every implement and means of art,
And twenty years' apprenticeship to boot,
Could make me such another?"

"The nests of some insects," continued he, "are well worthy of attention; and, from the ingenuity of their structure, cannot fail to fill the enquiring mind with admiration and surprise."

"Insects! do insects make nests, papa!"

"Do not bees make honey-combs?" said Mr. Carlton; "and what are honey-combs but a species of nest? Do not wasps build nests—and hornets?—have you never seen a hornet's nest?"

"No, papa; nor a wasp's."

"The singular dexterity with which the wasp constructs its habitation," said Mr. Carlton, "is well worthy of attention. It generally prepares it beneath the

surface of some dry land, or other convenient situation. Its shape is that of an upright oval, often measuring ten or twelve inches, at least, in diameter; it consists of several horizontal——.

"What do you mean by horizontal, papa?" interrupted Harriet.

"Horizontal signifies flat: horizontal is the opposite of upright, or perpendicular," said her father.

"The nest of the wasp consists of several horizontal stages, or stories of hexagonal or six-sided cells, the interstices of each story being connected here and there by upright pillars; and the outside of the nest consists of a great many layers, or pieces, disposed over each other in such a manner as best to secure the

interior, or inside, from the effects of cold and damp."

"But what are these outside layers, or pieces, composed of, papa?" enquired Paul.

"The whole nest, comprising both walls and cells, is composed of a substance, bearing a strong resemblance to the coarser sorts of whitish brown paper," said his father, "and consists of the fibres of various dry vegetables, attached together by a glutinous matter."

"And do wasps lay up a store of honey in their little cells, for winter use, as the bees do?"

"No: they do not possess so much prudent foresight. The female wasps deposit their eggs in the cells, one in each cell appropri-

ated for that purpose; from these are hatched the larvæ, or maggots, which are very similar to those of bees: they are fed by the labouring wasps with a coarse kind of honey, and when arrived at their full size, they close up their respective cells with a fine tissue,—or glittering network, if you please,—of silken filaments; and, after a certain period, emerge, or come forth, in their complete or perfect form."

"The nests of wasps vary considerably; I found a very elegant one, last summer, attached to, or rather suspended from, the straw thatch of the hermitage, in our garden; it was not much larger than a duck's egg, but of a circular form, and consisted of several round lay-

ers over each other, like the coats of an onion, the inner one only being entire, and furnished with a small orifice; in the centre of this inner nest, or bell, there was a number of little cells built round a small central pillar, attached to the bottom. Altogether, it was a most ingenious contrivance; and I was highly gratified by examining its structure."

"I like bees better than wasps, papa," said Harriet. "Look at that little creature, there, dipping its trunk into the bud of that beautiful dog-rose to get some honey. There, now it has flown—now it has settled again, upon a full-blown rose—how quickly it flies!—now it is gone—quite gone!"

"Is this the first time of your noticing—

"The little traveller
Who toils so cheerfully from flower to flower,
For ever singing as she goes,"

said Mr. Carlton.

"Oh no, papa, I have seen the bees before; and I know that bees make honey," said Harriet, "which they carry home to their hives and put into their little waxen cells: I saw a bee-hive once in old Mrs. Worton's garden."

"These bees are called the domestic honey-bees," said Mr. Carlton, "and the perseverance and industry for which they are so deservedly celebrated, entitle them to our admiration and gratitude, for all the honey we procure is collected

by them from the *nectaries*, or honey-cups of various flowers. There are various species of bees besides the *domestic* bee, each of which has its peculiar genius, talent, manners, and dispositions. Variety prevails in the order of their architecture, and in the nature of their materials. Some live in society, and share their toils, as though aware of the benefit arising from division of labour, as the common-bee. Others dwell and work in solitude, building the cradles of their families, as the leaf-cutter bee does with the rose-tree leaf, the upholsterer with the gaudy and fragile tapestry of the corn-rose, the mason-bee with a plaster, and the wood-piercer with saw-dust. All

are employed in their little hermitage with the care of providing for their offspring."

"The leaf-cutter! the wood-piercer! the mason!—I never heard of such bees!" exclaimed Paul, in astonishment. "Pray, papa, do tell us something about them."

"The wood-piercer," said Mr. Carlton, "is a red bee, and very hairy, with bluish wings. It is said to perforate trees, and to hollow them out in a longitudinal direction; it lines the bottom of these holes with saw-dust, and then builds its cells, which are composed of the farina of various flowers, and honey, or a kind of gluten, in the midst of the secure retreat. The mason-bee constructs its curious nest with a

peculiar sort of mud, which it has the art of cementing together. Then there is another curious sort of bee, for there are altogether fifty-five different species, which builds in mossy grounds, and the skill it displays is most admirable. In order to enjoy the pleasure of seeing its operations the nest should be taken to pieces, and the moss conveyed to a distance. The bees will then be seen to form themselves into a chain, from their nest to the place where the moss has been laid. The first or foremost will lay hold of some with her teeth, clear it bit by bit with her feet, (which circumstance has also procured for them the name of *carding-bees*,) then, by the help

of her feet, she drives the unravelled moss under her body; the second takes hold of it in the same manner, and pushes it on to the third; the third pushes it on to the fourth, and thus there is formed an uninterrupted chain of moss, which is wrought and interwoven with the greatest dexterity by those that abide by the nest; and, that their little abode may be perfectly secure from the winds, and shelter them from the rain, they throw an arch over it, composed of a kind of wax."

"Oh, how I wish we could find one of these curious nests!" said Paul; "but now, papa, for the leaf-cutter, if you please; how does it manage to make its nest of rose-leaves?"

"The nests of this species of bee," said Mr. Carlton, "are made with leaves, curiously plaited in the form of a mat or quilt. There are several varieties of the leaf-cutting bees, all equally industrious. They dig into the ground and build their nests, of which some have the form and size of thimbles inserted one within another, others the size and shape of goose-quills. These nests are composed of pieces of leaves. Each sort of bee cuts into its own materials; some use the rose-tree leaf, others the horse-chesnut; and, if you had but been in the habit of exercising your observation, you would no doubt have often discovered little holes in the leaves of the rose-tree, cut as with a pinking iron, and

might have been amused with seeing with what dexterity a bee, destitute of any mathematical instrument, cuts out a circular piece, fit to be either the bottom or the lid of one of those nests, or little oval bits for the sides :

' No tool had he that wrought, no knife to cut,
No nail to fix, no bodkin to insert,
No glue to join, ———
And yet how neatly finished.'

" Next time we call upon my friend Dr. N. I will beg him to show you one of the rose-leaf nests, which he has in his collection.

" Well, my dear children, do you not think there are many productions of Nature which you have too often allowed to pass unregarded?"

" Oh yes, indeed there are !" ex-

claimed both the children, "but then we have never before had our dear papa to point them out to us. We shall never walk again without looking for something or other, and without noticing what is passing around us, in order to tell you about it on our return."

"Then, I may hope that even the *London-road* will present objects of interest another time; may I, Harriet?" said her father, smiling.

"That you may, indeed, dear papa. I am sorry that I ever thought it dull. However, I intend to be wiser in future, and to acknowledge, with you, that the most trifling objects are interesting to those who are fond of gaining information. I never knew before

"I wonder what those men are about," said Harriet.

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to-day that even a spider's web might be the source of useful knowledge—that we might learn something even from a spider."

"The most insignificant of Nature's productions are well worthy of our attention," said Mr. Carlton. "They are presented to our view in every walk we take, and it seems to me like ingratitude to their great Author, to allow them to pass unobserved."

Our little party now came to a part of the road where some timber-trees had lately been felled, and several men were employed in stripping the bark, or rough outside, from the trunks that lay on the ground.

"I wonder what those men are about," said Harriet.

"They are collecting oak-bark, for the tanners, I believe," said her father.

"Who are the *tanners*, papa?" said Harriet.

"People whose business it is to tan leather."

"Then, is leather made of oak-bark?"

Paul laughed heartily when he heard this question, for he had himself visited a tan-yard, and had been made acquainted with the whole process of tanning; but the idea of leather being made of oak-bark diverted him so exceedingly, that poor Harriet looked sadly discomfited.

"Would it not be kinder to tell your sister what leather actually is,

than to laugh at her so much?" said his father; "ignorance is not a fault, except when it arises from inattention, and I believe no one ever gave Harriet any information upon the subject."

"But shoes are made of leather, you know, papa," said Paul, "and it is so very droll to think of shoes being made of bark—oak-bark,too!"

"Shoes are made of leather, I know," said Harriet; "but what is leather?"

"Leather is the tanned and prepared skins of various animals," said her brother: "your shoes are made of Morocco leather; and Morocco leather is the skin of a kind of goat."

Harriet looked puzzled, and as though she thought that the trans-

formation of goat-skins into shoes was as great as that of oak-bark would have been; and she enquired how it was done.

"The skins are first put into tan-pits," said Paul: "these pits are full of lime-water, in which the skins are soaked for some time; then they are put again into other tan-pits, which are filled with water, and the bark of oak-trees ground to pieces. This water gets into the pores or openings of the leather, and hardens it, for it possesses what is called an *astringent* property, and fits the leather to keep out water. The tanner uses a long knife with two handles, to scrape the hair off; from him it goes to the currier, the leather-dresser, and leather-cutter, who supply

the shoe-makers and others with what they want. Thus you see that oak-bark is very useful to the tanner, though he does not actually use it for making shoes."

"You seem highly diverted with Harriet's mistake still, Paul," said his father. "Perhaps you are not aware for how many useful purposes the bark—the actual bark—of various trees may be used. In the South-sea Islands, it is a common article of clothing, and various garments are manufactured of it, in its natural state. They take the stalks, or trunks, of the paper mulberry, which seldom grows more than seven feet in height, and about the thickness of four fingers: from these stalks they strip the bark, and

scrape off the outside of it; after which, the bark is rolled up, and softened for some time in water; it is then beaten with a square wooden instrument, full of coarse grooves; and, when sufficiently beaten, is spread out to dry, the piece being from four to six or seven feet in length, and about half as broad. These pieces are joined together with a sort of cement, made of the juice of a peculiar kind of berry; and, after being thus lengthened, they are placed over a large piece of wood, with a sort of stamp, composed of a fibrous substance, laid beneath them. The manufacturers then take a bit of cloth, and, having dipped it in a juice, made from the bark of the kokka-tree, rub it with

great rapidity over the piece that is making."

"But, of what use is this *kokka* juice, papa?" enquired Paul.

"It leaves a dry gloss upon the cloth," said his father, "and a dull brown colour upon the surface, and the slight impression left by the stamp at the same time, completes the work. Thus, a comfortable, though homely, article of clothing is manufactured. There are a great many different barks in use, in the several arts also, as well as the oak-bark in tanning. The bark of the alder is employed in dying; that of a peculiar sort of birch is converted, with some ingenuity, by the Indians, into canoes, capable of holding twenty

persons, or more; and the bark of the birch-tree, in some countries, is used as a substitute for paper, and is written upon with a sharp-pointed instrument. The bark of willows is sometimes employed for making a kind of rope. Cork is the bark of a sort of oak, which is chiefly cultivated in Spain, France, and Italy; and I need not tell you to how many purposes cork may be applied. The bark of the cocoa-tree forms the cordage of most of the Asiatic and African nations. In the East Indies, as well as in the South-sea Islands, they manufacture the bark of trees into a kind of stuff, or cloth. It is spun and dressed much in the same way as hemp; indeed, hemp and flax are

only the sap-vessels, or tough fibres, of the bark of those plants."

"Ah! ah! Paul," said Harriet, "*linen* is made of a sort of *bark*, after all, though *shoes* do not happen to be made of *oak-bark*. How pleasant it is to gain knowledge!"

Presently, as our young party proceeded on their walk, the shrill note of a sky-lark attracted their attention, and, in a few moments after, the little creature was perceived winging its musical flight up into the clear blue sky.

"What a sweet note it has!" said Harriet.

"Did you ever hear a sky-lark, before?" said her father.

"Never before, papa."

"And yet how many a sky-lark

has chanted its morning hymn of praise, while you have been walking up and down this road!" said Mr. Carlton. "You must exercise your organ of hearing, as well as your organ of seeing, my dear, in future. To those who are fond of nature, the very buzzing of a bee, as it skims rapidly from flower to flower, affords a train of agreeable emotions:

'Nor undelightful is the ceaseless hum
To him who muses through the woods at noon.'

—"You, Paul, must surely have heard the sky-lark before to-day; indeed, I think you cannot have forgotten the allusion your favorite poet makes to it, in the 'Farmer's Boy:'

'Just starting from the corn she cheerly sings,
And trusts with conscious pride her downy wings;

Still louder breathes, and in the face of day
Mounts up, and calls on *Giles* to mark her way.
Close to his eyes his hat he instant bends,
And forms a friendly telescope, that lends
Just aid enough to dull the glaring light,
And place the wandering bird before his sight;
Yet oft beneath a cloud she sweeps along,
Lost for awhile, yet pours her varied song;
He views the spot, and, as the cloud moves by,
Again she stretches up the clear blue sky;
Her form, her motion, undistinguished quite,
Save when she wheels direct from shade to light.'"

"Oh, papa, I will make a telescope,—a 'friendly telescope,' like poor Giles's," said Paul, pulling down his hat over his eyes, and placing one hand on each side of it so as to shield the light,—"there, there, now I see it quite plainly—quite distinctly, soaring in the blue sky—how sweetly it sings! In what situations do sky-larks build their nests, papa?"

"Generally among corn and high

grass," said Mr. Carlton, "and between two clods of dry earth, which they line with herbs and dry roots, being no less attentive to the concealment than to the structure of it. The sky-lark is a very tender parent, and, though she does not always cover her young with her wings, she directs their motions supplies them with food, and guards them from danger; the common food of the young sky-larks is worms, caterpillars, ants' eggs, and even grasshoppers; and the older ones live chiefly on seeds, herbage, and all vegetable substances."

"What difference is there between the common lark, and the sky-lark, papa?" asked Paul.

"The meadow-lark differs from

other larks by the blackness of its bill and feet," said Mr. Carlton, "and it has a more slender body than the sky-lark. It inhabits heaths, and wild uncultivated commons, and frequently the oat-stubble, after the corn is reaped, where birds of this species gather together in numerous flocks. When any body approaches the nest, the parent bird betrays her fears by her cries; whereas, other larks are silent and unmoved, when danger is apprehended. They make their nest close to the ground, sometimes in furze-bushes, and form it of moss, lined with straw and horse-hair."

"Papa, while you have been talking to Paul about the larks, I have been watching the clouds

flying away, one after the other," said Harriet. "I wonder what clouds are. Just look, papa! Do you see that beautiful white cloud yonder, half hid behind those fir-trees?"

"I do see it, my dear little girl, and perfectly agree with you in thinking it beautiful. You wonder what clouds are: clouds are fogs or vapors floating in the air; they are raised by a natural process, called evaporation, from the seas, lakes, and rivers."

"Pray, dear papa, tell me what you mean by evaporation; I am quite at a loss to know how clouds can be raised from the earth—from the seas and rivers, I mean."

"Heat," replied Mr. Carlton, "whether proceeding from the sun or

fire, causes the lighter particles of water to fly off, or evaporate, in the air: you have a proof of this every morning at breakfast; you see the steam rising like smoke from the lid of the tea-urn; this steam is nothing more than water, evaporated by the warmth of the heater in the urn. The heat of the sun causes the water that is in the seas and rivers to evaporate in the same manner, and, when raised to a certain height, that is, to the height of a mile, a half-mile, or less, from the earth; this vapour, on entering the colder regions of the air, becomes condensed into clouds. These clouds are carried by the winds over the land, and fall upon the earth again

in the form of rain. They then return again to the sea, in the form of rivers. So that there is a constant circulation of the waters; they are raised from the sea by evaporation, carried by the winds over the land, fall in rain, and then return again to the sea in rivers!"

"But what becomes of the water in little brooks or rivulets, like these, papa? and where does the water with which they are filled come from?" said Harriet.

"Springs and rivers are attributed to rain," said Mr. Carlton: "rain oozes down by the crannies of the stones, and enters the caverns of the hills. When these are filled, the remaining water runs over by the lowest place, and forms

springs, by gushing out of the sides of the hills, and trickling down their ascents. The water from these springs runs down the vallies, between the ridges of the hills, and, uniting with the water from other springs, forms little rivulets, or brooks; and these, meeting together in some valley, into which they happen to flow, become a river, which runs into the sea, their common reservoir. Thus is the constant circulation of the waters maintained!

'The streams, their beds forsaking, upward move,
And form again in wandering clouds above:
Hence rich descending showers, hence balmy dews,
Their plenteous sweets o'er brightening fields diffuse;
Hence shoots the grass, the garden smiles with flowers, [bowers.'
And sportive gales steal fragrance from the

"But the water in the sea is salt; is it not, papa?" enquired Paul.

"Yes, my love; but why do you ask that question?"

"Because, papa, rain-water is not salt; and, if rain-water be nothing more than water from the sea, I cannot tell why it should not be salt, as well as sea-water."

"You do right to reason in this manner, my dear boy," said his father, "this is the way to gain knowledge. It is only water that is evaporated; consequently, the salt remains in the sea, and the water that comes down from the clouds, is fresh and pure. Wonderful are the operations of Nature! affording a continual fund of interest and instruction."

As our little party were turning

out of the meadow into the high road, Harriet begged her father would wait a few moments, while she gathered a handful of what she termed purple crocuses, which were growing in profusion in the next field, and made it appear like a purple carpet. Mr. Carlton willingly agreed to her request, and she presently returned with as many as she could carry in her hand.

"Are they not beautiful, papa?" said she, hastening towards him; "but I wonder they have no leaves."

"This flower, resembling a garden-crocus, is called the meadow saffron, or autumnal crocus," said her father; "and it is remarkable, that its long, narrow, shining, green leaves, always ap-

pear in the spring, whilst the blossom itself invariably appears in the autumn. The meadow-saffron is a very hardy plant, so much so, that it will continue fresh a long time, without either mould or water; you may place the flowers you have procured in your little spar basket, when we reach home, where, I dare say, they will remain fresh for many weeks."

"So I will," said Harriet; "but, do you know, papa, that there were a number of people in that meadow gathering the saffron; they, indeed, gave me the roots I have in my hand;—I cannot think what they intended to do with such a quantity of flowers."

"The outer and colored part

of a flower,—the purple leaves of your saffron-crocus, for instance," said Mr. Carlton, "is always called the *corolla* by botanists; these little pointed things, like little columns, in the middle, are called the *stamens;* and this higher column, which is divided into three parts, and is of a bright orange-colour, is called the *stigma,* or pointal. You see it is covered with a sort of powder."

"Yes, papa."

"This powder is called *pollen,* or *farina*; and the stigma which it covers is a very valuable commodity; it is used as a dye—to dye various things; and the people you saw in the meadow were, no doubt, collecting it for this pur-

pose. The artificial spar, of which your little basket is composed, is tinged with saffron, to give it that yellow cast. Saffron is used for various purposes. You see, my love, that even so insignificant a thing as the pointal of a crocus may be applied to some useful purpose. With what a variety of subjects has this walk furnished us! with how much to amuse, to interest, and to instruct! But the church spire, peeping among the tall poplars, reminds me that we are near the termination of our walk. May you never retrace it again without exercising that invaluable property, the *Use of Sight.*"

"I will look at every spider, and at every insect, I can find, in future!"

said Harriet. "I will examine every flower, flax, dog-rose, autumnal crocus, or what not! I will listen to every bird that sings, whether it be a blackbird, a thrush, or a sky-lark! I will notice all that is passing around me. I will never tell you again, papa, that the London-road is tiresome, and dull, and uninteresting. I will never envy the *Julia* in my "Original Poems" again, for I have seen to-day even more than she saw, and I might see as much every day if I walked, as you say, with my *eyes open*."—"And I," said Paul, "will follow Harriet's example, and never again allow any thing to pass unnoticed, unobserved, or unregarded; for I think,

papa, that the beauties of Nature ought to be admired, and that the different purposes to which the various productions of Nature may be applied, ought to excite our gratitude, which they never can do, unless we accustom ourselves to your favorite habit of observation."

"I hope you will, each of you, scrupulously adhere to the resolution you have formed," said Mr. Carlton; "for, believe me, when I say that those who accustom themselves to the exercise of the *Use of Sight*, possess a continual and never-ceasing fund of happiness, of which they would otherwise be destitute.

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