OUR PONDS AND OUR FIELDS

AND

WHAT MAY BE SEEN THERE

AUNT LUCY'S RETURN FROM WOODVILLE

OUR PONDS

AND

OUR FIELDS,

And what may be Seen There.

WITH COLOURED FRONTISPIECE.

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OUR PONDS AND OUR FIELDS.

THE GARDEN SNAIL AND WOLF SPIDER.

"I AM so glad you have come," said Charles Long to his cousin Clara, a little girl about eight years of age. "Alfred has gone back to school, and I feel so dull without him; I have been wishing for you all the morning."

"And I have been wishing to come, too," said Clara, "for Aunt Long sent for me directly after breakfast. Mamma did not wish me to come before, but I am to stay all the rest of the day; so we will have a good long time together. What shall we do?"

"Oh! come into the garden, and play at horses; or I will give you a ride in my wheelbarrow, if you will give me one afterwards."

To this Clara agreed, and they ran into the garden, but they soon found that these sports were not suited for a day in August, although the weather was cloudy. Weary and hot, they flung themselves on the grass-plot.

"I wish we could do something," said Clara, "without making ourselves so hot."

"Oh, if you will help me, I know something," replied Charles. "Mamma has promised me a new watering-pot if I clear the snails from the walls in a week: I should be glad if you would help me."

"I will help you with pleasure," replied Clara; "but that job will not take us long."

"Indeed, we shall be tired long before it will be done," said Charles; "I have already picked off several hundreds from that wall alone, and there are some remaining yet."

After Charles had found two empty flower-pots, he and Clara began their search.

"Snails can only eat the leaves of the fruit-trees," said Clara; "I do not think there is much use in disturbing them, poor things! Peach-trees and nectarines are not like young seedlings."

"No; snails cannot kill the trees as they do young plants," said Charles, "but they are very mischievous, for all that. Look at these green nectarines, completely peeled by them. See, here is one with the snail on it, eating away."

"Why, how can such a soft animal as a snail eat so hard a thing as an unripe nectarine?" said Clara.

"Very easily," replied Charles, "because, soft as it is, it has eight sharp teeth."

"Oh, where?" asked Clara. "I cannot see them."

"Nor can I; but you can see its four horns, with

its two black eyes at the top of the upper pair, can you not?"

"Yes, I can see those plain enough," replied Clara.

"Well, mamma told me that the mouth is placed under the lower pair of horns, and that it contains eight small teeth, with which the snail bites leaves, fruits, and stems. They are so sharp and strong that the snail can even bite its own shell if it chooses."

"How very curious?" exclaimed Clara; "no wonder snails can eat up both leaves and fruit so quickly. But what becomes of the snails in the winter time, when there is scarcely any food for them?"

"They creep into holes, or bury themselves in the ground when the cold weather comes on, and they sleep the whole winter through until the warm weather returns. I think they often cluster together to keep each other warm, because I have found a dozen or twenty together in holes and corners in the early part of the spring."

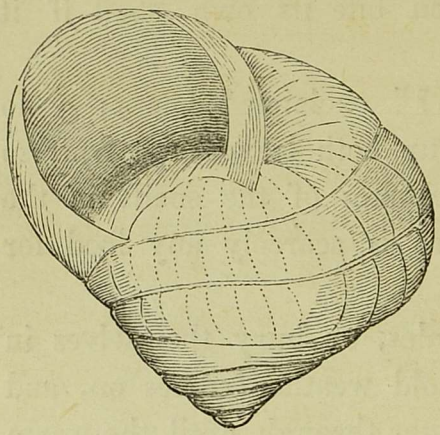
"But are they not sometimes attacked by other insects when they are buried in the ground?" said Clara.

"I do not know exactly how the snail manages to protect itself then," replied Charles. "In the autumn, I know it covers the opening of its shell with a kind of skin; but the skin is so very thin,

that although it may keep out the cold, I should think many insects might easily break through it."

"Is that kind of covering something like the skin which periwinkles have at the end of their bodies?" said Clara; "I mean that round tough piece of skin which exactly fits the opening of the shell."

"Yes, it is very much like it, only it is not nearly so tough and hard as the periwinkle's," said Charles. "There is a much larger kind of snail, which closes the opening of its shell with a very hard cover, more like a piece of plaster of Paris than anything else. No bird or insect can break through that; so the snail sleeps safe enough till the warm spring awakens it. These snails are of a light brown colour. Mamma told me that the people in Rome used to consider them as delicate food. They were brought to England a long time ago, some think by the Romans. The summer we were at Dorking, we saw several on Box Hill, and mamma has seen them at Reigate and Guildford."



"I should like to see that kind of snail," said Clara, "but I should not like to eat it at all."

"I dare say we should be glad enough to eat them," said Charles, "if we could get nothing else. Papa met an African traveller only the other day, who had just returned to this country. He told papa that before he left England he had accustomed himself to eat all kinds of strange dishes. He had snails, and worms, and frogs, and spiders, cooked for him, that he might not dislike them so much when he could not find other food."

"Well, I should have waited till I was obliged to eat such disagreeable food," exclaimed Clara.

"The traveller told papa that he was very glad he had conquered his dislikes before he left England, as he had been often forced to put up with such food in the deserts of Africa. Let me look at your flower-pot, Clara, for I think we have not got on very fast while we have been talking."

"Indeed, but I have; my pot is nearly full," said Clara; "the snails are very cunning; they hide themselves under the leaves."

"Yes, and between the stems and the wall, and in the holes of the mortar; sometimes I find many near the ground. The old snail lays its eggs in the ground, a few inches deep, near the wall. The eggs are something like a tiny bunch of grapes, and when each egg is hatched in the spring, out comes a small snail, with a little soft shell on its back."

While Charles was speaking, Clara stooped to

examine the lower part of the wall. "Is the little snail just like the old one?" said she.

"No, not quite," answered Charles; "when they are first hatched, the shells have only one turn; but, as the snail increases in size, it makes its house larger."

"Why, how can it do that?" said Clara.

"It forces out of its body a shining substance, which hardens in the air," replied Charles. "If you look at a large old snail-shell, Clara, you will see that there are four turns and a half, and that the edge of the mouth of the shell is bent a little. Mamma told me that this edge is called the lip of the shell, and that after it is formed the shell does not increase in size."

"I think I know what you mean by that shining substance," said Clara; "I have seen a poor snail that had had its shell broken, squeezing out ever so much froth: was that to mend the shell with?"

"Yes, that froth hardens in a short time, and quite fills up the hole. You can always tell the new patches, because those parts look so much fresher. Is your flower-pot filled yet, Clara? Mine is quite full."

"And mine is almost," said Clara; "let us go and empty them both. Where must we put the snails?"

"I will empty the pots into the large watering-

pot, and then cook will pour boiling water over the snails, which will kill them in a moment."

"Oh, Charles, how shocking!" exclaimed Clara. "I did not know, when I was picking them off the trees, that you were going to kill them."

"Why," said Charles, "we must get rid of them in some way. We have no right to throw them into the lane, because then they would crawl into our neighbour's garden; and killing them by hot scalding water, in a moment, is much better than the gardener's way of smashing them with his foot. Mamma does not think it cruel. She is very particular, though, that the water should be quite boiling, because, if it were merely warm, the snails would suffer a great deal of pain, and that would be cruel, because most of this pain we might prevent."

"I do not wish to look for any more snails," said Clara, putting down her flower-pot.

"Well, I will fill the rest of your pot; you have helped me a good deal, Clara."

While Charles was searching for a few more snails, Clara observed several spiders running very quickly over the border. Their colour resembled that of the earth, particularly where it was a little moist.

"Look, Charles," said she, "how very fast these brown spiders run. The moment I moved this lump

of earth, a dozen ran from under it. They are very

odd shaped spiders. They look as if they had two stomachs; the large stomach is as big as a pea, and of a whitish-grey colour. See, they run so quick, I cannot catch one of them!"

"That large round thing is not a stomach," said Charles, laughing; "it is a bag of eggs, which the spider carries with it, till the young ones are hatched."

"I thought spiders laid their eggs in holes in the wall, or in cracks in palings," said Clara; "I think I have seen them too, wrapped in silk at the bottom of their large cobweb nests."

"I have seen them in all these places, but those eggs were laid by different kinds of spiders. The spiders that we are watching do not spin a web to catch their prey, but hunt for it. They are called wolf-spiders, and fierce little fellows they are. I watched one the other day creep like a cat towards a small fly that, quietly brushing its wings, was settled on a stone. The spider moved so slowly at first, that I thought the fly would be off; but, when the spider was tolerably near, it suddenly quickened its pace, and, seizing the fly, dragged it to a hole under a clod of earth."

"I think that spider has a very good name," said Clara. "Do you know, Charles, whether there are

any other spiders that kill their prey in the same manner?"

"Yes, several, and still more suddenly, because they pounce upon the prey, springing upon it from a height as a hawk does upon a small bird. What do you think, Clara, of a spider killing a bird?"

"Oh, is that possible?" said Clara.

"I believe so. It is a great spider, that is found in the woods of South America. Its body is three inches long, and when its legs are stretched out, it measures nearly a foot across. It must be pretty sharp in its movements, for it seizes and kills the beautiful humming birds, which are so very quick in their flight, that they look like little glittering spots in the air, and hardly ever seem to rest for a moment."

"That American spider ought to be called the tiger-spider," said Clara; "but have we any spiders in this country that spring in that way?"

"Yes, I believe so; but then they are little things. Mamma pointed out one to me last week, striped like a zebra. I put my finger near it, and it sprang upon it three or four inches from the wall."

"Did it hurt you?" said Clara.

"Oh, no," replied her cousin.

"I wish, Charles, you would catch one of these wolf-spiders for me; they run so quickly that I cannot manage it. I should like to take one into the

house to show my aunt, and then we could look at it together. I am sure we shall be cooler in the shady parlour than here."

"Very well, I will catch one of the spiders for you in a trice," answered Charles. "Wait till I have taken these snails to cook; and I will bring back a tumbler with me."

When Charles returned, he moved aside two or three clods of earth, from under which several spiders ran. Most of them carried a bag of eggs under them, placed nearly at the end of the body. Charles easily secured two in the tumbler, which he covered over with his pocket-handkerchief. Then he and his cousin went into the house. They turned the tumbler upside down on the table, and gently removed the handkerchief.

"Aunt Long," said Clara, "Charles has caught two spiders, and we want to show them to you. He calls them wolf-spiders. Have you ever seen a wolf-spider?"

"Yes, my dear," said Mrs. Long, as she left her work at the end of the room, and came towards the table. "The attachment of those spiders to their young is quite remarkable."

"How do you know that, mamma?" said Charles.

"Because if I were to take the bag of eggs from one of these spiders, you would see her strive with all her might to regain it," said Mrs. Long. She would

show no fear of us, and instead of running away, would brave every danger to recover it. If she thought the other spider had it, she would in endeavouring to seize it, fight as courageously as the white bear does in defending her young."

"Mamma, could you take the bag away from the spider, without hurting it?" said Charles, eagerly.

"Yes, because it only adheres (that is, sticks) by a slight glue."

As Mrs. Long spoke, she gently lifted the tumbler, and with some difficulty secured the smaller of the two spiders. She carefully disengaged the bag of eggs, without breaking it, and then placed the spider on the table. The poor mother did not attempt to scamper away, as she would have done if she still had had her precious eggs with her; but she slowly wandered over every part of the table—over books, work-box, and other things—as if searching for something. A second time she wandered round, but did not attempt to leave the table.

"Oh, do put the bag of eggs on the table, aunt," said Clara; "the poor spider ought to have it now."

Mrs. Long did so, and after some little time they saw the spider rush quickly to it, and seize it with her mandibles (that is, her upper pair of jaws).

"Look! look! mamma," said Charles, "she is running off with it just as the cat carried her kitten yesterday. But that bag of eggs is a very large

thing for the spider to carry. She has stopped behind your work-box, mamma. I dare say she thinks that nobody will follow her now. See, she is pushing the bag underneath her, between her legs. She has got it in the old place again. I suppose she is glueing it there. She is running again. How quickly she goes now. She will be off the table in a moment. I must stop your journey, though, Mrs. Spider:" and so saying, he caught the spider.

"Oh, do not take the bag from her again," said Clara, as her cousin was once more separating it from the spider.

"Only for a few minutes," replied Charles; "I should like to see whether she will suppose the bag of the other spider to be her own, and whether she will strive to get it. May I try, mamma?"

"Yes, if you like," replied Mrs. Long, "if you do not let them struggle too long."

Charles instantly placed the spider under the tumbler, and in a moment both spiders were struggling for the possession of the bag.

"Why how very strange!" said Clara; "the spider cannot know its own bag, if it is so eager to seize the other's; and yet, aunt, the colour is different; one is of a darker grey than the other."

"I have tried this experiment several times," said

Mrs. Long, "and I have always observed that the spider was quite as contented with a strange bag of eggs as with her own."

Presently, the bag of eggs separated from the real mother, and the smaller spider struggled violently to obtain it. Both spiders reared themselves up, extending their front legs, in a menacing attitude, and by every motion showed their angry feelings.

"The little spider has conquered," said Charles; "the other one has rolled right over, and the little one is scampering away with her bag. I will let her out, before she gets it snatched from her." He lifted the tumbler as he spoke, and gently drew the spider, with the bag, from under it.

"Put the bag of eggs, that you took from her first, near her," said Mrs. Long, "and then we shall see if she prefers her own."

Charles did so; but the spider took no notice of her own bag, but ran quickly on with her stolen treasure, climbing from the window to the balcony, and so into the garden. The spider remaining in the glass was set at liberty. At first she wandered over the table much in the same manner as the other had done, but on perceiving the neglected bag of eggs, she eagerly seized it, and was running off with it, when Mrs. Long caught her, and gently holding her, pricked the bag of eggs with a needle.

Immediately, to the great amusement of Charles

and Clara, the young ones ran out of the bag in great numbers, and spread themselves over the old spider, almost covering her.

"Mamma, this reminds me of the picture yo showed me of the Surinam toad," said Charle "But will the spider keep the young ones on her back, as the toad does?"

"Yes, for some time, till the first skin is peeling off," replied Mrs. Long. "Although each of these little spiders has broken through a tiny egg-shell, they are still covered with a delicate skin, and till this comes off they cannot catch their prey. I believe, during this state the old spiders feed them, but I am not sure, because it has been said that food is not necessary to them, until after they have cast their first skin. We will not keep them to try, for we should be very likely to forget them; so carry them all into the garden. Unless spiders be very numerous in a garden, they are harmless, and we should not uselessly destroy any living thing."

"Do spiders live long, aunt?" asked Clara.

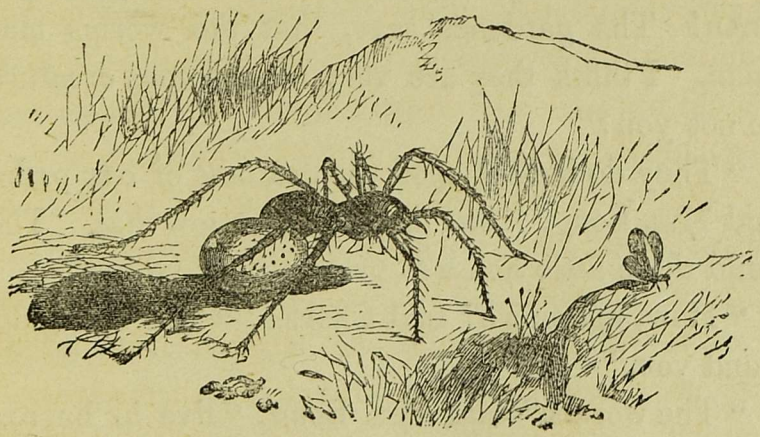
"Not more than a few months, I believe," answered Mrs. Long; "most of them die before their eggs are hatched. The wolf-spider, you observe, lives to see her young ones around her, but she dies as soon as they can provide for themselves. If you happen to move the grass growing near the edge of ponds, you may often disturb the wolf-

spider; and then you will see it run over the surface of the water, instead of concealing itself under the clods of earth as it does in our garden."

"I have never seen that," said Charles.

"Perhaps not; but if you look carefully you will," said Mrs. Long.

"I am glad I thought of bringing the spiders to show you, aunt," said Clara. "How many entertaining things you have told us. When I go home, I shall look in our garden for a wolf-spider, and then I can tell my sister Mary all about it. I am sure she does not know what a curious insect it is." The two cousins then returned to the garden, where they amused themselves in tying up the flowers, and hoeing and raking the ground, till dinner-time.



A WALK IN THE GARDEN AFTER A SHOWER.

"MAMMA, the rain has left off, and the sun shines quite brightly," said Charles Long to his mamma: "will you come and walk in the garden? I like you to be in the garden while I am running about."

"Yes, Charles," said his mamma, "I will come with pleasure."

When Mrs. Long had put on her bonnet and shawl, she followed her little boy into the garden.

"Mamma," said Charles, "is it not a pity to see the nice paths covered with all these little heaps of earth! The gardener says, that the worms make them. I think they are very mischievous creatures, do not you?"

"They do indeed spoil the neatness of our paths," said Mrs. Long, "but they cannot know that. They build these little heaps to protect their young."

"How, mamma?" said Charles, "I do not understand you."

"The worms," said Mrs. Long, "live in burrows in the ground, where they lay their eggs. In these

burrows they also keep a few leaves, straws, or small plants for food, for themselves and their young ones. The worms close the openings to the burrows, because they fear that the rain might fill them and spoil their work; and also to prevent those insects from entering that live upon the eggs of worms, and the young worms."

"Do you know what those insects are?" said Charles.

"I do not know them all," said Mrs. Long, "but I believe that fierce little black fellow, the Staphylinus, is one of them. You must have often seen the Staphylinus turn up its tail, Charles, when you have happened to place your foot near it."

"Oh, I know the insect you mean, mamma," said Charles: "if you touch it ever so gently, it opens its wide jaws and turns up its tail quite angrily. But, mamma, why is there a piece of a leaf at the top of most of these worm-hills?"

"Because, my dear," said Mrs. Long, "the worms like to close their holes with some young plant, or leaf, which they partly drag into their holes. When the plant is nearly decayed, it makes a delicious meal for their young ones. Worms like decayed or rotten leaves better than fresh leaves, and by

dragging the leaf partly into their holes, they prevent its being blown away. But look, Charles, I will carefully remove one of these mounds, and we will watch what the worms will do."

Then Mrs. Long cleared the earth from one of the holes very gently.

"How will the worm find out that you have taken the covering away?" said Charles, "for there is no rain now to enter his little house. Oh, I know; he will see the bright light; for before you took away the earth he must have been in the dark. Is not that the reason, mamma?"

"It may be the reason," said Mrs. Long, "but I cannot be certain, for no one has yet discovered eyes in the earthworm. All that we know is, that the worms dislike the light; for when a light is held near them, they shrink into their holes, and therefore I think we shall soon see the opening mended."

"There is the worm, mamma," exclaimed Charles. "There he is! look how he peeps about as if he were afraid. He will not leave his hole. I can see something in his mouth, and he is sticking it round the opening. The worm seems to me, mamma, to suck in the earth, and then to squirt it out again, quite soft like mud. How quickly he works! Is not he a clever fellow?"

"Do not make a noise, my dear," said Mrs. Long, "or you will frighten it into its hole. Do you observe

how neatly and smoothly the inside of the little hole is finished, while the outside is left quite rough?"

"Yes, I can see that quite plainly," replied Charles; "but how does he manage to make the inside so smooth?"

"I believe the worm uses its tongue as a trowel," said Mrs. Long. "See, Charles, the worm is crawling out; speak low, my dear, or it will hide itself."

"I suppose, mamma," said Charles, very softly, "that he is going in search of a leaf for the little door of his house. He is crawling over the flower-bed. There he goes. Oh, mamma, he has turned up one of your young stocks that have just come up; look at him; he has pulled it right into his hole, all but the little top of it that sticks in the clay; I do not like the worms to spoil your plants at all, mamma."

"We must try and prevent the mischief, Charles," said Mrs. Long. "If we put a few ashes round the young seedlings, the worms will not touch them, for they do not like to crawl over the rough ashes. Worms are very useful to us, though they sometimes spoil a few plants. By making holes in the ground they loosen it, and then the rain entering, nourishes the young plants. The roots of plants and trees grow better in earth that is frequently loosened than in hard ground. That is the reason why the gardener digs and hoes round the trees and plants so often."

"Some of the worm-hills," said Charles, "have no leaves on the top; how then do these worms close their little houses?"

"They make use of a straw, or sometimes of a lump of clay," answered Mrs. Long.

"I think, mamma," said Charles, "that there are very few worms about, although there are so many little mounds. Why do they not come out of their holes?"

"They travel about at night chiefly," said Mrs. Long, "in search of food, and seem to prefer rainy weather. I have sometimes on a fine moonlight night seen the lawn covered with them. Those worms that live in holes on the lawn do not quit them, as the food is within their reach, but fixing their tails firmly in the hole, they stretch out their long bodies."

"I suppose, mamma, when they are frightened," said Charles, "they shrink suddenly into their holes."

"Yes," said Mrs. Long, "and sometimes as suddenly pass out. Worms are very fearful of the mole, who attacks them in their burrows; and the moment they feel the ground move, they dart to the surface of the ground. You may very easily see how soon they are alarmed, Charles."

"How, mamma?" said Charles, "I have never even seen a mole; how can I then watch the worm darting away from him?"

"Because, my dear," replied Mrs. Long, "the worm is frightened at any sudden movement in the earth. If you ask the gardener to stick the pitchfork in the ground, near the place where he supposes there may be any worms, you will see that they will appear above the ground immediately."

"Oh, I will be sure to ask him," said Charles; "but I cannot to-day, for the gardener told me he should not be here again till to-morrow. I like to watch the worms, mamma. Shall we take off another mound to see whether the opening will be mended?"

"You can stay if you like, my dear," said Mrs. Long, "but this side of the garden is too damp for me to stand still longer."

"Then, mamma," said Charles, "I will show you my garden; that is nice and sunny. I have altered it since you were there last. Does not my new path look pretty? You see it divides my flowers from my lettuces, radishes, and mustard and cress. I should like to have a seat at the end of this path very much, and I am sure I can make one, mamma, if you will be so good as to give me that old board in the tool-house. May I have the board?"

"Yes, Charles," said his mother, "you may have it."

"Thank you," exclaimed Charles; "it will be quite large enough for you, mamma, and you will like to sit in my garden, shall you not?"

"Yes, my dear," answered Mrs. Long; "it will

be very pleasant to sit and read in your little garden, while you are digging and weeding."

"And then when I have worked till I am famously hot," said Charles, "I can sit by your side to rest myself. Have you seen my poor apple-tree, mamma, that you gave me last year? All the blossoms seem spoiled, and I do not think I shall have one apple this year. See, mamma, the blossoms are all withered and stuck together."

Mrs. Long carefully examined the blossoms, and she asked Charles if he knew what occasioned the mischief.

"No, mamma," said Charles, "I do not; the gardener says it is the blight, but I do not know what he means by blight; and when I asked him, he looked up, and said it was in the air."

"My dear boy," said Mrs. Long, "the word blight has puzzled wiser heads than either the gardener's or yours. I believe gardeners call a frost, a cold wind, a great number of insects, or anything that injures the trees or plants, a blight. It was once imagined, that there were thousands and thousands of the eggs of insects floating in the air, as well as the smaller caterpillars, and that they appeared in large numbers in certain places, when brought there by a strong wind. But this is a mistake; for the parent insect, when at liberty, always lays her eggs where the young caterpillars may find proper food the moment

they are hatched. These eggs are almost always covered with a sticky matter, to fasten them to the place where the mother insect lays them, and therefore they cannot be blown about by the winds. Your silkworm eggs are quite firm on the paper where your silk-worm moths laid them last year, Charles, are they not?"

"Yes, mamma, quite firm," said Charles; "but do you think my apple-tree blossoms are spoilt by an insect, or by a cold wind?"

"You will be able to tell me yourself, Charles," said Mrs. Long, "if you will allow me to pluck off this bunch of blossoms from your tree."

"Oh yes, mamma, you may take anything you like in my garden; besides, I should like to know how all this mischief is done."

While Charles was saying this, Mrs. Long plucked a bunch of blossoms. The flowers were all joined together by a fine cobweb; and, as she carefully unfolded them, she asked Charles what he saw inside.

"A very small caterpillar," answered Charles: "it has a green body and a little black head. But can this small caterpillar do so much mischief, mamma?"

"Yes, my dear," said Mrs. Long; "from the moment it is hatched it begins to eat. It fastens the blossoms together to make a secure little house,

and goes on eating and eating until it is ready for its change."

"I know what change you mean, mamma," exclaimed Charles eagerly; "I have never forgotten how insects change, since you let me keep silkworms. First, the egg is laid by the moth or the beetle, or any other perfect insect; then, when the egg is hatched, out comes the little caterpillar or maggot, which, after some time, leaves off eating, and becomes a chrysalis; it looks quite dead then, but by and by the skin cracks, and the perfect insect crawls out just like the one that laid the egg. Is it not so, mamma?"

"Almost, my dear," said Mrs. Long. "Some few insects, when young, have nearly the same shape as the parent, and only change their skin at different times. A few other kinds of insects resemble in their young state the parent insect, except in the wings, which they have not. But almost all insects go through three great changes—from the egg to the caterpillar or maggot, from the caterpillar to the chrysalis, and from the chrysalis to the perfect insect. One other thing you must remember, Charles. Some insects in their chrysalis or pupa state, as it is called, do not appear dead: grasshoppers, dragon-flies, and some others, continue to move about as briskly as before."

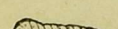
"And what is the name, mamma," said Charles,

"of the perfect insect that has laid its eggs in my apple-tree, and when did it lay them?"

"I believe that the apple-bud-weevil is the name of the insect," said Mrs. Long, "and that it laid its eggs in the young flower-bud last autumn. It is a red insect, and may often be seen running up the branches of apple-trees in the autumn, searching for the flower-buds, and then is the time to prevent, by destroying them, the mischief they may otherwise occasion."

"Mamma, will you be so good as to draw me one," said Charles, "that I may know it when I see it? I will run into the parlour to fetch a pencil."

"I have a pencil in my pocket, my dear," said Mrs. Long, "and a card also. Look; this is the shape of the apple-bud-weevil. Weevils are something like beetles, only the head is more pointed, with this curious forked snout. And this is the shape of the chrysalis, and the caterpillar, or grub."



"Your drawing, mamma," said Charles, "is just like the caterpillar in the apple-blossom, but why do you call it a grub? I think it has the same shape as many other caterpillars that I have seen."

"If you look at its legs, Charles," answered Mrs. Long, "you will see but six in front, and the young of

beetles and weevils, which are properly called grubs, have never more than that number. But the true caterpillars that change into four-winged insects, such as moths and butterflies, have not only six legs near the head, which are always armed with claws, but from two to sixteen legs under the body, that help them to cling closely and to climb quickly."

"But, mamma," said Charles, "what becomes of the grub of the weevil when the blossom of the apple falls off?"

"The grub falls also, ceases to eat, and buries itself in the ground, to remain there during its chrysalis state," said Mrs. Long; "after a few months it changes to the perfect insect. There are many other insects that destroy the apple-blossom, the fruit, the leaves, and the bark; but I do not see any of them at present."

"Thank you, mamma," said Charles. "I shall now know that mischievous weevil quite well. It is not cruel to destroy insects when they do mischief, is it?"

"No, my dear," replied Mrs. Long, "but we ought to be very careful to give them as little pain as possible, by killing them quickly. Some thoughtless people will leave a poor insect suffering for an hour after they have attempted to kill it: this *is* cruelty."

"I hope the snails and slugs will not touch my young lettuces," said Charles: "I think I had better get some ashes and put round them, mamma."

"Yes, that will be a good plan," said Mrs. Long: "but what is that little heap of stones for in that corner?"

"Oh, mamma!" exclaimed Charles, "that is not a heap of stones! that is my frog-house. I have put a little piece of wood for a door, and the frogs are quite warm and comfortable there. Look at them; I will take away the door, and, if you stoop down, you will see them."

As Charles said this, Mrs. Long stooped down to look into his frog-house.

"One, two, three, four, five, six, seven, eight frogs!" exclaimed Mrs. Long. "Why, Charles, they are quite crowded; they cannot be comfortable in that small place; it is not larger than a garden-pot. They can scarcely have any air."

"Oh, yes, indeed, mamma," answered Charles, "they have plenty of air, for I take them out of the house very often, and give them a ride in my wheel-barrow."

"I think the jolting and shaking must be still more disagreeable to them than the confinement. Do you think it would be agreeable to you to be put in a small room, from which light and fresh air were shut

out, with seven or eight other children, and only to be taken out in a great box for a short time, without being once allowed to jump or to hop?"

"No, mamma, I do not think I should like that," replied Charles; "but I am sure I try to make my frogs happy, for I have given them all kinds of leaves for their food. I suppose frogs are not often hungry, for they have not eaten one half yet?"

"No, that is not the reason," answered his mother. "Frogs do not eat leaves: they live upon insects, snails, small worms, and maggots. Your poor frogs that you thought were so happy must have been very hungry and very uncomfortable in their prison; they have not had the power to procure their proper food, while you have been filling their house with useless leaves!"

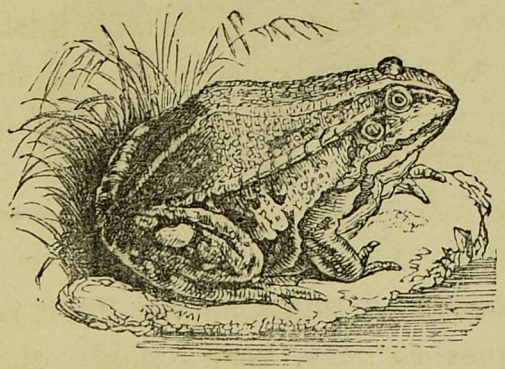
"I am sure I did not mean to starve them," said Charles: "I will let them out directly."

"That is right, Charles," said Mrs. Long; "it is better to lose a little pleasure than to hurt a poor animal."

As the frogs came out one by one, glad to regain their liberty, Charles said, "Mamma, one of the frogs looks as if he had a broken back; the middle is quite pointed; its skin is of a greener colour than the skin of the others, and it has, besides the dark spots like the other frogs, three stripes of yellow

down the back. Is that a different kind of frog, mamma?"

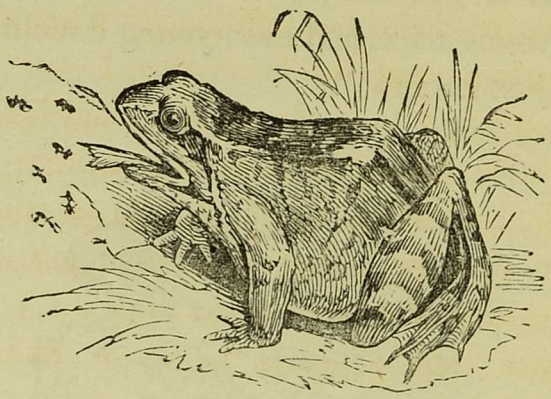
"Yes," said Mrs. Long, "it is called the edible frog. Edible means good for food; and in Italy, Germany, and France, this kind of frog is eaten. I believe, however, the common frog is also frequently eaten, although it is not considered so nice as the edible frog. Both kinds of frogs live upon insects and worms, but the edible frog is so voracious and bold, that it will sometimes venture to attack and swallow young mice, and even young ducklings when they are just hatched."



"How strong it must be," said Charles: "but look, mamma, three of the frogs have hopped on that ant-hill. I don't think they will get any food there, for ants keep in their holes in rainy weather."

"Stop a minute," said his mamma, "and let us watch. I think the noise that the frogs make in

moving so near the ants, will frighten them from their holes. Besides, although ants dislike very rainy weather, they generally work soon after the rain ceases, because the earth is moist, and they can press the little heaps that they carry into the shape they wish. They will even work in a gentle shower. See, Charles, the ants are now running about in all directions, and the frogs are darting out their forked tongues to seize all that come near them."



"But, mamma," said Charles, "the frogs move their tongues so very, very quickly, that I cannot see how they catch the ants. I wonder the ants do not tumble off."

"They cannot fall off," said Mrs. Long; "the tongue of the frog is covered with a sticky substance like paste, and therefore the moment the tongue touches the ant, it holds the ant quite fast. The tongue of the frog is differently placed to our tongues,

Charles. It is fastened inside the *front* of the mouth, and not to the back; and when the frog is not using it to seize insects, it is turned back, with the tip towards the throat."

"I understand you, mamma," said Charles; "the frog packs up his tongue, something like I do when I roll up my tongue. If the frog did not turn his tongue back, there would be no room for the tongue in his mouth, and the tongue would be obliged to hang out. How many ants the frogs must have eaten while we have been talking! They dart out their tongues a great deal faster than I can."

"I have heard of a tame toad," said Mrs. Long, "that was fed upon flies and other insects. When its master held it in his hand near a window, it would sit quite still, darting its tongue with great quickness, while it swallowed fly after fly."

"Mamma," said Charles, "I should like to read about that tame toad. Do you think one of these frogs could be tamed?"

"I do not know, my dear," said his mamma.

Charles took up one of the frogs very carefully, and held it towards a fly that was settled on a bush; but the frog was frightened, and quickly jumped off Charles's hand.

"It will not stop on my hand, mamma," said Charles; "do you know how the gentleman tamed his toad?"

"When we go in, Charles," said Mrs. Long, "I will show you the account, and then you can read it yourself; but now let us walk quickly, or we shall get chilly."

Charles ran for his hoop; and after he had gone several times round the garden, guiding his hoop carefully when he passed his mamma, he became quite warm, and then he and his mamma went into the house. He hung up his hat on the peg in the passage, and put away his hoop and stick, and then running into the parlour, said, eagerly, "Now, mamma, for the tame toad, please."

Mrs. Long took a book from the book-case, and after marking several parts with a pencil, she gave it to him, and said she had marked those parts that she thought he would like to read.

"Thank you, mamma," said Charles; "may I read it to you while you are working? I will begin with the toad."

"You may read it to me, my dear," said Mrs. Long, "but you had better begin with the common frog, because you will then understand it better."

"Very well, mamma," said Charles; and he began to read some account of the common frog, the edible frog, and the common toad.

"The common frog is seen almost in every damp place where the frog can find its favourite food, insects,

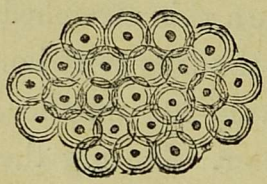
small worms, and snails. Its fore feet are divided into four toes, and the hind feet are strongly webbed like the foot of a goose; that is, they have a skin stretched between each toe. The web assists the frog to swim. Frogs generally seek the water in very hot weather, and again in the beginning of winter. During the cold winter months they lie at the bottom of ponds, plunged in the soft mud, or in holes in the bank in a torpid state."

"I know what torpid means, mamma," said Charles, "you told me yesterday; very fast asleep for a long, long time."

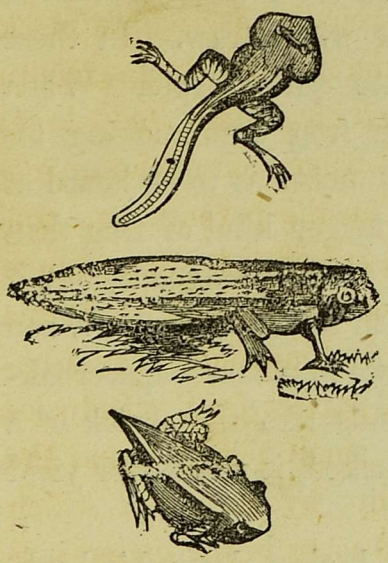
"Yes," said Mrs. Long; "and during this time the animal neither eats nor drinks."

Charles continued. "In the northern parts of North America, when the cold is very severe, frogs have been dug up frozen as hard as ice. In this state their legs break like a piece of dry stick; but what is very curious, without awaking them from their torpidity. If, however, the injured frog be wrapped in flannel, and gradually warmed near a fire, it will recover its feeling, and soon come to life. Upon first coming out of their winter holes, frogs change their skin, and they continue to do so every eight or ten days during the summer. When the old skin has just peeled off, the frog looks of a brighter colour than usual.

"The eggs of the frog may be seen in large clusters in the ponds in the month of March, like hundreds of white transparent beads, with a black dot in the middle. In the month of April a small tadpole is hatched from each of these eggs, which at first is not at all like the parent frog. Indeed, no one who had not heard of the great change the tadpole goes through, could imagine that this strange looking animal could become a perfect frog. Tadpoles have a small fringe round the under lip, by means of which they can hang to the under surface of the leaves of the plants that grow in the water. While they live in the water they feed chiefly upon the duck-weed. When the tadpole is about six weeks old, the hind legs make their appearance, and soon afterwards the fore legs. The tail being now no longer necessary, begins to get less, and at last falls off, and the little animal first ventures upon land. They are sometimes seen in such vast numbers, marching to some wood, or moist place, that the ground has been covered with them; and ignorant people have been very much frightened, thinking



they came from the clouds in showers like rain. As soon as the tadpole has changed into the perfect frog, it no longer feeds on leaves, but upon insects and small worms, and it therefore leaves the pond in search of food.* The young frogs travel all night, and conceal themselves during the day under stones, and in holes. When evening arrives, they again continue their journey. If, however, it happens to rain in the day time, they will come out of their holes to refresh themselves. The common frog makes a low croaking noise in the evening, but not nearly so loud as the edible frog, and some other kinds. Both the common frog and the edible frog live about fifteen years. The edible frog is so much admired as a delicate dish in Austria,



* All these interesting changes can be observed in a fresh water aquarium, as well as many other habits of the inhabitants of our ponds. Care should be taken, by means of a floating island (made of a piece of cork) or by a piece of rock sufficiently large for the upper part to be dry, for the perfect frog or insect to be able to escape from the water. The glass or muslin at the top of the aquarium will prevent their leaving the aquarium itself till removed by the observer.

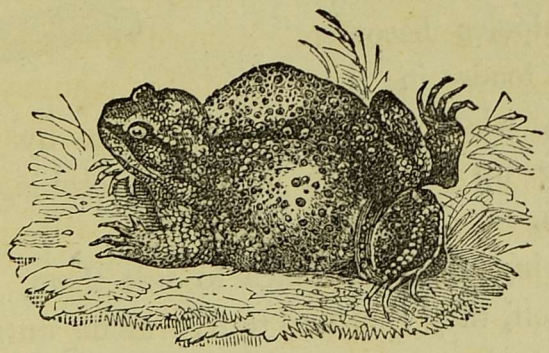
that thirty or forty thousand are brought at a time to the city of Vienna. The people who provide frogs for the market keep them in large holes, covered over in the winter with straw. In these holes the frogs never become quite torpid. When large numbers of the edible frog are croaking together, they make so loud a noise as to be heard at a great distance. It is a larger kind of frog than the common frog, and much more courageous, but it is not nearly so often seen in this country. When pursued by a snake it will take immense leaps, croaking so sharply, that it sounds like the shriek of a child; but when closely attacked, it will never yield till forced by its enemy."

"Mamma," said Charles, laying down his book, "have you ever seen a frog climb a tree? I have; I watched one the other day, crawling up the cherry-tree that is trained against the wall near my garden. I think it was a young edible frog. It used its front legs just as I would use my hands and arms, and climbed from twig to twig, till he reached about the middle of the wall. It then fell down, and it did not try again."

"I have never seen a frog climb a tree," said Mrs. Long, "but I have often observed them climbing a wall where two walls meet, and supporting themselves by pressing their feet against both sides. There is a beautiful little green frog both in America

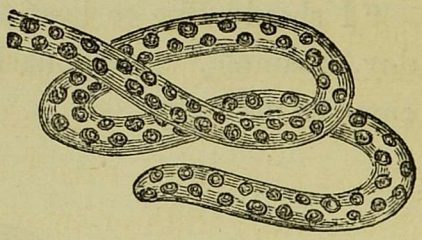
and in Europe, that lives amongst the topmost branches of trees, where it swings from branch to branch, something like a monkey; but its feet are very differently formed to those of our frogs."

"I should like to hear about that frog some other day, mamma," said Charles; "but now we have come to the toad."



"The common toad so abounds in some parts of South America, as in Carthagena and Porto Bello, that in rainy weather not only the marshy ground, but the gardens, courts, and streets are almost covered with them. In these countries the toad is of great size, the smallest being at least six inches long. If it happens to rain during the night, it is then still worse; they crawl about in such great numbers that they nearly touch one another. On such occasions it is almost impossible to stir out of doors without trampling them under foot at every step. The toad passes the winter in ponds during its torpid state, or

in hollows in the roots of trees. It is a dull heavy-looking animal, but the eye is beautiful. The hind-feet are only slightly webbed, the web not extending more than half way up each toe. It lays its eggs in the form of a necklace, not in clusters like the frog. The tadpoles become perfect toads in the autumn, when they may be seen by hundreds crawling up the bank of ponds, seeking a drier situation.



"Having found a place to suit them, each one for himself, they continue to live alone until winter; only venturing out in moist evenings. The toad is covered with small bumps, so that the skin is rough. When irritated it does not attempt to escape, but stops suddenly, swells its body, and presses from various parts of its skin a sticky bitter liquid which smells disagreeably. The bite of the toad and this liquid have generally been considered to be highly poisonous, but this cannot be true. It is well known that numbers of persons have handled toads without receiving any injury. The negroes of Senegal, in travelling across the burning sands of that country, are in the habit of applying a toad to their foreheads for the sake of its refreshing coolness. Both frogs

and toads are always covered with moisture, though this moisture is more abundant at one time than at another. It defends their skin from the heat of the air and sun. The bite of the toad produces a slight inflammation that occasions no real inconvenience.

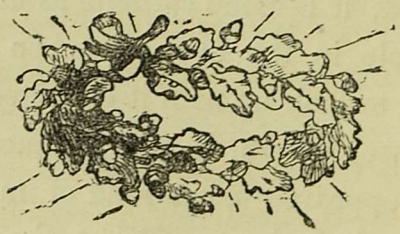
"Many anecdotes have been related of the extraordinary power of the toad to live without food, and almost without air, even for years. It is difficult to discover the truth or error of these accounts; but we know from the experiments of a French gentleman, that out of three toads which were shut up in boxes securely covered with plaster, *two* were found alive at the end of eighteen months.

"Neither toads nor frogs are difficult to tame. Both may soon be taught to be taken in hand and carried about without fear. A gentleman in Devonshire kept a tame toad, which continued in his garden for nearly thirty-six years. It was generally found near the steps of the hall door. By being constantly fed, it became so tame as always to come out of its hole in the evening when a candle was brought, and to look up as if it expected to be carried into the house, where it was frequently fed with insects. It appeared most fond of maggots, which were kept for it in bran. When the maggots were placed on the table, it would fix its eyes on them, and remain quite still for a moment, and then dart out its tongue so quickly, and swallow the maggot so

instantly, that the eye could not follow it. The motion was faster than winking the eye. This favourite toad was injured by a tame raven, who seeing it one day peep out of its hole, pecked an eye out, and although the poor toad lived a year after, it never recovered from the wound."

"Oh, mamma, how sorry I should have been," exclaimed Charles. "I will try and tame a frog. You see, mamma, the book says that both frogs and toads can be easily tamed. I should like to see the frog come out of its hole to meet me. I should then be quite sure it was happy, because if it did not like to stay it could hop away."

"Yes," said his mother, "I think that is a very good plan; and now that you have finished reading, my dear, be so good as to ring the bell for tea."



THE MARTINS.

"WHAT are you looking at so attentively?" said Mrs. Long to her son Charles, who was earnestly gazing from an open window.

"I am watching two swallows, mamma, that have been flying backwards and forwards for the last quarter of an hour. Do come and look at them; they cling for a moment to the side of the house, or to the eaves, and then off they dart over the fields and trees. They never stop to eat for an instant."

"There is no need of their resting to eat, Charles," said Mrs. Long. "They can easily catch winged insects as they fly; their mouths open so wide. They have probably destroyed hundreds of insects during the time you have been at the window."

"Well, that is strange!" said Charles, "I have watched them as attentively as possible, and I have not seen them open their beaks once."

"No; because the motion of seizing the insect is so quick; but if you were sufficiently near, you

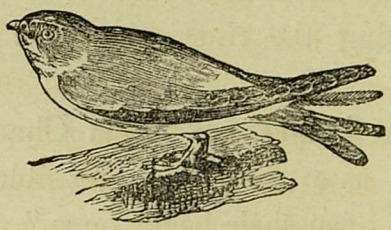
would hear the loud snap which the bill makes in closing."

"Why do the swallows return so often to the eaves of the house? Do you think they will build there?" inquired Charles.

"I think they probably may, my dear," answered his mamma, "but not for some days to come. These birds appear to me to have only just arrived from warmer climates, at least I have not observed any window swallows before, this year; and I believe most of the swallows spend several days in sporting and playing about, before they begin their nests for their young."

"But, mamma," said Charles, "I have seen a great many swallows every day for the last fortnight. I have watched them flying about in all directions."

"You have very likely seen a great number of *chimney* swallows, Charles," said Mrs. Long, "for they generally appear the first fortnight in April; but these two we are watching are not



chimney swallows. They are *window* swallows, or martins, as they are also called."

"Is it not the same kind of swallow, mamma," asked Charles, "that builds in barns, chimneys, the corners of windows, and the eaves of houses?"

"No; look carefully at the shape of the martin now clinging to the roof of the house. The tail and wings are much shorter than those of the chimney swallow, and the legs are covered with short downy feathers to the toes. It can also be easily distinguished from the chimney swallow by the bright white colour of all the under parts of the body. This kind never builds in chimneys nor in barns, but either in the corners of windows, under the roofs of houses, or against rocks and cliffs."

"I wish these martins would build against our house, mamma," said Charles. "How I should like to watch them making their nests and feeding their young. Can you tell me where swallows fly to in the winter, and all about them?"

"I am afraid, Charles, *no one knows all about them*, that is, the complete history of their habits. Many interesting facts have, however, been collected concerning them. I believe that large numbers of both martins and swallows pass over in the autumn as far even as Senegal in Africa, for their winter retreat; but they do not build there. Swallows have been seen hundreds of miles from land. Many thousands have been observed at one time in the south of Spain, waiting for a fair wind, and then

passing in large flocks over the Mediterranean Sea into Africa."

"But, mamma," said Charles, "how can the swallows keep so long on the wing as they must sometimes do when flying over the sea?"

"When they fly over a great extent of ocean, it is probable that many must die of fatigue," answered Mrs. Long, "as several have been known to drop on the decks of ships, exhausted and half-starved; but I should think that most swallows and martins travel overland from the colder countries, only passing over the sea when they cannot help it. A swallow flies at least seventy or eighty miles an hour; and therefore one day's journey would enable it to traverse a great distance. The martins do not fly so quickly as the chimney swallows. Their short wings and tails are not suitable for extraordinary swiftness, but their power of flight is still very great."

"Do you think," said Charles, "that if I were to keep a swallow in a cage, and feed him very carefully, he would wish to fly away?"

"Yes; I believe it would, Charles," answered his mamma, "for people have tried that experiment. The birds have been easily tamed in the summer, but on the approach of the usual time for migration, September and October, they have appeared restless and uneasy, fluttering from side to side, and beating

their wings with great violence. This agitation much increased when the cage was hung outside the window; as the poor prisoners could then see the flocks of swallows and martins assembled on the roofs of the houses previous to their departure. The wild swallows were observed to hover over the cage for some time, seeming to invite their friends to join them. When, however, the caged birds were not allowed to see the wild swallows, they soon became calm; and after all the flocks had left the country, they returned to their usual cheerful state as if nothing had happened."

"But, mamma, why do people keep swallows?"

"Because it is very interesting to study their habits, which have been much misunderstood. For a long time, Charles, indeed until very lately, all our European swallows were supposed to pass the winter in a dormant state, either in holes or crevices, or under the water."

"Oh, mamma, how could a bird live under the water."

"I believe, my dear, that it is quite impossible; for the swallow is formed to live in the air, and could not breathe like a fish or a frog in the water. But notwithstanding this fact, many persons believed the contrary; and even clever and learned men have asserted that they have seen the fishermen in the northern countries draw from the sea in their nets

clusters of torpid swallows, which, if kept sufficiently warm, might be restored to life."

"How could they make such a mistake?" exclaimed Charles.

"Because," said Mrs. Long, "they were not accurate observers. They were so astonished at the annual appearance and disappearance of thousands of swallows, and almost all at one time, that they were ready to admit any explanation of this wonderful fact, and were easily imposed upon by the ignorant and careless."

"But, mamma," said Charles, "the swallows might be dormant in the winter, like squirrels and dormice."

"Yes; and I believe they have occasionally been found in holes and nooks," said Mrs. Long. "Perhaps they were weakly birds that were fledged unusually late, and were not strong enough to join their companions. Mr. John Hunter, the celebrated surgeon, who was a very accurate observer, took the pains to have a room fitted up for swallows. There were large tubs of water half filled with reeds and rushes, old stems of trees and rough grotto work, so that if inclined, the swallows might retire either to the water or to dry holes for their winter sleep. When the birds were assembling by thousands among the reeds and rushes of the little islands in the Thames, previous to their departure, Mr. Hunter

had several secured and placed in the room prepared for them. Not one of these birds showed the least desire to bury itself in the water or became at all torpid. A number of swallows have also been kept for years by one gentleman, without showing any inclination to become dormant."

On the 12th of May, about a fortnight after the above conversation, Charles ran to his mother's room to tell her that he thought the martins were now certainly beginning to build. "I have been longing for you to come down to breakfast, mamma, for I have seen three pairs of martins flying backwards and forwards for the last hour, and I want you to come into the garden with me, that we may watch them together."

"I will be with you in a minute, Charles," answered his mother, and she quickly followed her son into the garden.

Charles was correct in his observation. Three pairs of martins were now commencing their mud dwellings under the eaves of the house.

"Do look, mamma, at that martin which has just settled. How he clings against the wall, while he dabs the earth on the brickwork with his beak. I should have thought he would fall."

"It very likely would do so," said Mrs. Long, "if it did not partly support itself by leaning its tail firmly against the wall. The foundation is the most

difficult part to build, because if the mud is not well plastered so as to adhere firmly, the weight of the upper part might easily loosen it, and the whole would then fall to the ground. They mix the earth with little pieces of straw, and moisten it well in their mouths before they use it."

"They can get plenty of water from our pond, mamma," said Charles, "and I have seen them skimming over it several times this morning."

"That was not for the purpose of wetting the earth for their nests, Charles," said his mother. "Swallows and martins can sip as they fly, but they cannot carry water in their mouths as you can do. They moisten the earth in the same way that we moisten our food, and perhaps that kind of liquid may be of a sticky nature, and help to make the little pellets of earth adhere to the wall."

"Do you think, mamma, they will finish their nests to-day?"

"No, Charles; they will leave off working in the middle of the day, that the part which they have built may dry well; but to-morrow morning, long before you and I are up, they will be busily employed. The nest will be finished in about a fortnight, I should think. But papa taps at the window, and we must leave the martins for breakfast."

During breakfast, Charles asked his father if he had ever observed martins building?

"Very frequently," said his father. "I am particularly fond of the swallow tribe, they are so cheerful, active, and industrious. Besides, they are very useful, for by their consuming a great number of insects, we are not annoyed by gnats and flies so much as we certainly should be without their assistance."

"I shall be very glad when ours have finished their nest, papa," said Charles. "What will they line them with, for those lumps of earth must be very rough for the young birds? Do they smooth the earth inside?"

"I believe not," said Mr. Long, "or very slightly; but as they make a nice little bed of grasses, small straws, wool, feathers, or moss, the roughness of the nest is not of much consequence."

"I will make a collection of the materials that you have mentioned, papa, in a heap on the grass-plot," said Charles, "and then, perhaps, I shall see the martins make use of them."

"Yes; I think you will," said his father. "These martins have chosen a good situation for building, as the projecting roof of our house will defend the nests from rain. Martins very frequently build where a heavy shower will expose their nest to destruction, and yet they will, year after year, attempt to rear their young in the same insecure place."

"Then, father," said Charles, "you think our martins will come again next spring to build here?"

"They will probably make use of the very same nest, Charles," said Mr. Long, "and perhaps will continue to do so for years, only clearing and repairing them. The *chimney* swallow, on the contrary, always builds a new nest."

"But how can people know they are the same martins that return to the old nests, father? They may be different ones, you know."

"People have several times tied coloured silk round the legs of the martins, and when they have returned in the spring, they have been observed to have the silk still round their legs."

"Oh, how I should like to try that," exclaimed Charles; "will you do it for me in the autumn, father?"

"Yes; if we can catch the martins, Charles."

Day after day, Charles watched the martins, till at the end of ten or twelve days the three nests were completed. He had the pleasure to see the martins peck at the little heaps of moss, feathers, and wool that he had prepared for them, and carry the pieces to their nest. He wished he could see the inside of a nest without destroying it, but as that was not possible, he waited patiently till the eggs were hatched. His mother told him that each hen-bird

had probably laid five white eggs, but that he would see nothing of the young birds for some time.

Shortly after the nests were completed, Charles heard a loud chirping among the martins; and looking up, he saw a sparrow striving with all his might to enter one of the nests and turn out the martin. After a long struggle, the sparrow was obliged to fly off. Charles asked his mother why the sparrow should attempt to turn out the martin, as sparrows can build very good nests for themselves. Mrs. Long said that she did not know the reason, it might either be to save labour, or to secure more quickly a suitable shelter. Sparrows, she added, roost all the year in their nests.

Many days passed, and Charles almost forgot the martins, till his mother called his attention to the young birds hanging their heads out of the holes of the nest, and opening their wide mouths continually. It was very entertaining to watch the parents feeding them. No labour seemed to weary them; and they spent the whole day in catching insects on the wing to supply their young with food; only resting for a moment to feed them, and then again flying off. They rolled the insects which they caught into a little cluster under their tongues to convey to the young birds. As soon as the young birds were able to fly, they accompanied the old ones in short flights; and Mrs. Long told Charles

that for some time they would be fed on the wing, the young bird meeting the parent in the air and receiving the food from its bill. Some of the young nestlings were more forward than others, and Charles watched them for several days hovering near the nest, or clinging to it.

About the beginning of August, the young birds left the nest entirely, and frequently assembled with other martins on the roofs of the neighbouring houses. As soon as the young had quite left the nests, the parents prepared for their second brood, clearing the insides of the nests and lining them with fresh moss, feathers, and straw.

Mrs. Long told Charles, that for some days previous to their departure in the autumn, all the nests would be deserted, and the martins would roost on shrubs, trees, or the roofs of buildings.

"Do all the swallows and martins go at one time, mamma?" inquired Charles.

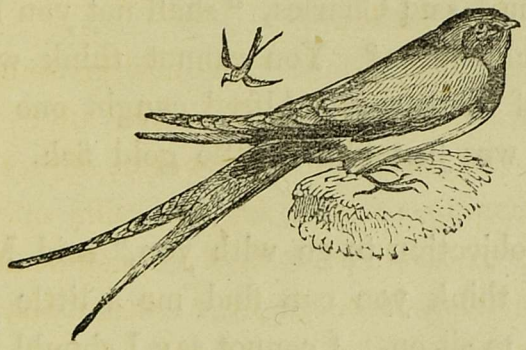
"No," answered Mrs. Long; "the martins remain in this country for two or three weeks after the chimney swallows. Both kinds, however, depart in large flocks, seeming to wait on the cliffs of the south and east of England, till their companions arrive, and then they take flight in large bodies. The chimney swallow, the bank swallow, and the wift, all live in this country during part of the year, Charles; and you may observe them also at

some future time, without forgetting your friends, the martins."

"If you will be so good as to show me where to find them all, mamma, I should like to watch them. I know where to find the chimney swallow, with its long tail and wings, because you told me that it built in barns as well as chimneys, but I do not know anything about the bank swallow and swift."

"It is almost too late to observe the swift," said Mrs. Long, "for it leaves us much earlier than the rest of the swallow tribe, but the bank swallow remains till September or October. We will walk to the chalk pit this afternoon, to see if we can find any of the holes which they bore for their nests."

"Thank you, mamma; and I will go and ask papa to walk with us."



A WALK TO THE PONDS.

"MAMMA, I wish you would go with Alfred and me to the brickfields," said Charles Long to his mother; "we are going to fish for sticklebacks, and, you know, you can walk near us while we are fishing, and then we can all talk together."

"Mamma is very much obliged to you, I dare say," said Alfred, laughing. "Why, Charles, you would not like to stand waiting and waiting, while another person was employed in doing something that you did not care about."

"But, mamma," said Charles, "shall not you like to see our sticklebacks? You cannot think what beauties some of them are! Alfred caught one the other day that was just like a little gold fish. Do come."

"I have no objection to go with you," said Mrs. Long, "if you think you can find me a little dry mound or bank to sit on. I cannot say I should like to walk up and down as you propose, Charles, but I can take my book with me, and then I shall be quite

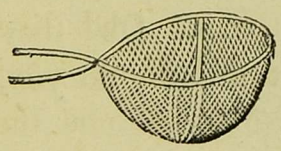
comfortable, even if you stay the whole morning there."

"Oh! thank you," said both the boys together, "we will find you a dry seat."

"Will you be so good, mamma," said Alfred, "as to give us a small piece of muslin? Papa has given us a strong piece of wire, and I have made the framework for two nets, and now I want some thin kind of stuff to cover them with. Two pieces, about the size of the top of my hat, will do."

"Let me look at the frames, Alfred," replied Mrs. Long, "and then I can better judge of the size."

Alfred showed his mamma the two frames which were made of wire, bent in a circle, and measured six inches across. The two ends of the wire were twisted, and left four inches long to strap to a walking-stick. There were two cross bars of wire, so bent that the net might be pretty deep. Mrs. Long soon found two pieces of coarse muslin, which she cut to the proper size, and gave the boys to sew thickly round the wire frames, while she prepared to accompany them.



When Mrs. Long returned, she found the boys quite ready, Alfred with the walking sticks and nets, and Charles with six large phials. The distance

to the brickfield was not great, so that they were soon there. In this field were several large ponds, formed by the hollows from whence the clay had been dug. The boys were some time before they could fix on what they considered the best situation. At length, they observed a sandy bank sloping gently, near which the water was so clear, that they saw dozens of delicate sticklebacks swimming about; and there they determined to fish. They soon chose a dry, clean seat for their mother, which, they assured her, was free from snails and ants. Every now and then she heard their exclamations of surprise as a brilliant little fellow glided by uncaught by the nets.

"There! there! do you not see that beauty, Charles? You have lost him, how foolish! Now look at me, I put the net right under him. He is gone, I declare! Hush, do not make a noise; there is a little shoal coming this way. Oh! they are only tinkers. You do not want tinkers, do you, Charles?"

"No, I do not care about those black fellows," answered Charles, "I shall go a little further from you; we should not both try in one place."

In a minute Charles shouted out, "I have caught him! It is a gold one!" and he ran to Mrs. Long, with the net in one hand, and the phial in the other. "Look, mamma, look at the colours! Is it not a

beautiful little fish? How it does jump about! Just hold the net, please, while I fill the phial with water."

Charles filled the phial, and then with great care he took hold of the stickleback by the tail and dropped him in. "You are safe now, little fish," said he. "How red and shining you are!"

"It is a very pretty little fish, indeed," said Mrs. Long. "What a bright circle of blue there is round the eye! Do you see the little gills, Charles?"

"Yes, mamma, I see those small pieces of skin that keep opening and shutting by the side of the head. What are they for?"

"To breathe with," answered Mrs. Long.

"But can fish breathe air in the water, mamma? I did not know that there was any air in the water."

"There is air in all water," replied Mrs. Long; "but some kinds of water contain more air than others. Have you ever tasted water, Charles, that had been boiled?"

"Yes; I drank some yesterday that was in a jug, and had become cold, because I did not like the trouble of pumping some spring water. But it did not taste nice and fresh like the pump water."

"That pleasant fresh taste of the pump water,"

said Mrs. Long, "is occasioned by the quantity of air that is mixed with it. When the water is boiled, some of the air is separated from the water, and mixes with the air in the room. Now do you know, this little fish, as well as all other fish, can by some means separate the air from the water. He takes a good mouthful of water, as you see, into his mouth, and then he presses it through the gills, but the water that comes out of the gills has but little air in it. The fish has separated the air from it. A fish can no more live without air passing into his body than we can."

"It is like breathing through our cheeks, mamma," said Charles. "How curious! You can see the motions of the fish very nicely in this phial. When he wants to come up to the top of the water, he moves his tail very quickly, mamma, and then up he darts. Now he dives to the bottom again."

"Some fish, Charles, cannot easily rise to the surface of the water, such as the sole, skate, and other flat fish. They are almost always found at the bottom."

"I should have thought such large strong fish as those, mamma," said Charles, "might easily swim about as they please. Why cannot they rise like the stickleback?"

"Because flat fish are without a particular kind of bladder, called an *air-bladder*, which is found in

the stickleback and most other fish. This bladder, Charles, is placed under the back-bone. When it is full of air, the fish rises to the top of the water, and when the fish presses the air out of the bladder, which he has the power of doing, he instantly goes down. If you were to prick a little hole in the air-bladder of that stickleback, so as to let the air out, the poor little fish would sink to the bottom of the phial, and would be unable to rise again."

"I should not like to spoil his pleasure, mamma," said Charles; "besides, it would hurt him, and that would be cruel. I shall go to the pond, and try to find some companions for him."

"Do, Charles," said Mrs. Long. "I should like you to take home half a dozen, which we could keep in a tub of water. I wish to see whether a statement which I saw in a book the other day is correct. It is said that the stickleback is a very quarrelsome fish, and that when several of them are placed in a vessel together, they will dispute the possession of any part of it. The conqueror becomes of a beautiful red colour, while the beaten party, losing all brilliancy, changes to a dingy slate. This curious change is said to take place every time a battle occurs."

"Oh, I should like to see if that is true," exclaimed Charles; "I will get as many as I can."

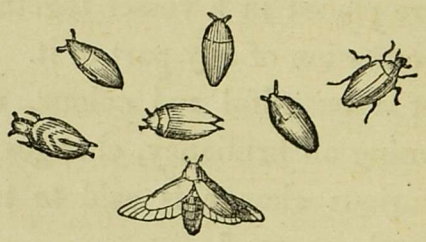
As Charles went to the edge of the pond again, he called out, "Mamma wants some more sticklebacks, Alfred. Have you caught any?"

"No, they are so shy!" answered Alfred; "I have been trying these ten minutes to catch a little black insect, which has been darting about ever so long. I thought I had him once, but he is gone, and my net is half full of mud and clay. There are some strange looking insects jumping about in it though, and numbers of merry-go-rounds."

"Oh! I like those," said Charles; "save the merry-go-rounds for me, they are such shining little things."

"Fill the bottles, then, while I take the net as it is to mamma," said Alfred; "make haste, for I shall lose some of the insects, if I do not put them into the water quickly."

"Not too near, Alfred, if you please," said Mrs. Long, as Alfred approached with his net dripping with muddy water.



"No, mamma, I will take care; but we want you to tell us the names of these insects. Some of them I have never seen before. The merry-go-rounds I know well enough. I have seen them hundreds of times."

"So have I, Alfred," said Mrs. Long, "but yet it was not till yesterday that I learnt many interesting particulars about them. Do you know that they have four eyes, which, I believe, no other water insect has?"

"Why, what can be the use of four eyes, mamma?" said Alfred; "other insects see well enough with only two."

"The merry-go-rounds, or *gyrini*, as they are called in Latin," answered Mrs. Long, "are fond of sporting about on the surface of the water, where they assemble, as you must have seen, in little troops. Now the upper pair of eyes are formed for seeing *out* of the water, and the under pair for observing *in* the water; so that they can be always on the watch against their enemies."

"Yes, and now I can understand, mamma," said Alfred, "why they seem to dart sometimes very suddenly. They must see danger much sooner than other insects."

"When we go home," said Mrs. Long, "if we place these gyrini in a tumbler of water, you will see that after a few turns they will remain quiet on the surface, but that the moment you approach the tumbler with your hand, they will dart off in all directions. Here is Charles with the phials of water. Put these little black insects in, Charles."

Charles did so, and asked his mamma if she did not think them very pretty. "I have often watched them," said he, "playing about in the ponds. They chase one another, and make little circles in the water, and look as bright as glass. I am glad you caught them, Alfred, for I never can manage to catch any."

"Look at the bubble of air on the backs of those that are diving," said Alfred, "it makes them look like silver."

"They dart so quickly," said Charles, "that I cannot see their legs well. How many have they, mamma?"

"Six, Charles," answered Mrs. Long; "the first two are used as arms to seize their prey with, and the other four for swimming. When you go home I will give you a magnifying glass, and then you will see that their feet are hooked. This assists the insect to cling to water-plants, when it wishes to remain at the bottom of the water. If it did not cling to something it would instantly rise to the top, because it is lighter than water."

"I think, mamma," said Alfred, "that these gyrini are more often seen in ponds than almost any other insect. I have observed them in mere puddles of water."

"Yes; because they fly by night," said Mrs. Long, "and often change their abode; and if they are

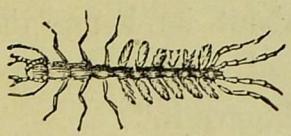
pursued by other insects, they probably seek the first piece of water they can find."

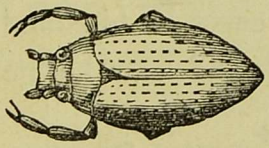
"I do not see any wings," said Charles."

"No; because the real wings are covered by the black wing-cases, just as the wings of the common beetle are covered. You know I showed you the wings of the beetle the other day."

"And what is the shape of the merry-go-round, mamma," said Alfred, "in its young state, before it becomes a winged insect?"

I can hardly describe it to you, Alfred, the form is so singular," answered Mrs. Long; "but I will show you a print of it when we return home, as well as a print of the perfect insect magnified. The larva is, I believe, but seldom found. Before it changes to its chrysalis state, it crawls out of the water up the stem of a plant, close to the side of the pond, and from some matter which it presses out of its body it makes a little case, something like gray paper, in which it fastens itself up. When it becomes perfectly winged, it cracks the case and jumps into the water."

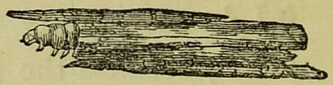




"What makes those little pieces of stick move about in your net, Alfred?" said Charles.

"Oh, they are only the caddis-worms," answered

Alfred, carelessly. "The boys bait their lines with them for angling."



"I see no worms," replied Charles, "they look to me like little bundles of sticks moving about of themselves. What are they, mamma?"

"Alfred has told you the right name of the insect that moves those little sticks," said Mrs. Long. "Take up one of the little bundles in your hand, my dear, and you will see that it is a little hollow case, and that the insect lives within it. In dragging about its house the caddis-worm only puts out the head, so that amongst the mud in the net you did not observe it."

"Oh, now I see his little brown head, mamma," said Charles, as he took one of the cases in his hand. "How does he make his house? and can he get out?"

"He can go in and out when he likes," said Mrs. Long; "and when he finds he has grown too large for it, he makes another. First, he makes a little case of silk, open at each end, and covers it with small pieces of rush, or wood, or straw, which he bites to

the right length. He does not always use the same materials, for sometimes he makes the case with sand, small stones, or even little shells; but however rough the outside of his house may be, the inside is always smooth. When he is going to change into the chrysalis state, in which he neither eats nor moves, he crawls on some plant that grows above the water, and fastens his case to one of the leaves; then he carefully closes the two openings of the case by a thick net-work of silk, which allows the water to pass freely through, but prevents the entrance of his enemies. As he takes care to place himself near the surface of the water, he can easily escape when his great change arrives."

"What does he change to, mamma?" said Charles.

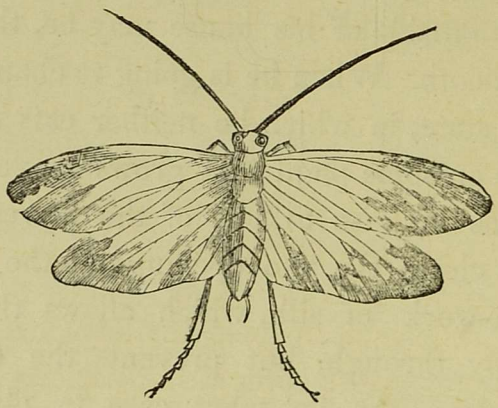
"To a large four-winged insect," said Alfred, "with four transparent wings. Does he not, mamma? I think you showed me one hovering near the candle one evening last summer."

"Yes; the caddis-fly often enters the rooms of an evening, if the windows are left open," answered Mrs. Long, "and I dare say you have seen them, Charles, but have very likely mistaken them for moths."

"Have I?" said Charles. "Well, I will look sharp the next time I see insects fluttering near a candle, mamma, and then I will ask you to show me which is the caddis-fly."

"Remember, the four delicate wings of the caddis-

fly," said Mrs. Long, "are not covered with down like those of the moths and butterflies."



"What is this little green insect, mamma," said Alfred, "with three tails?"

"I do not at this moment remember," answered Mrs. Long; "and as I wish now to read my book, put the remaining insects into the phials, and I will tell you all that I know about them when we are at home. Keep the more delicate insects apart from the others."

"Yes; we have done so, mamma," said Alfred, "and if you will take care of the phials with the insects, we will fish for the sticklebacks at some of the other ponds."

The boys then left Mrs. Long, and she was not interrupted again for some time.

CARRIER AND WILD PIGEONS.

"I HAVE had such a pleasant day, mamma," said Charles Long, as he entered the parlour where Mrs. Long was sitting; "I have been ever since breakfast with Fred Lawson. You cannot think what a many entertaining things there are at his house."

"Then, I suppose you have been in Mr. Lawson's fine poultry-yard, Charles," said Mrs. Long.

"Oh, yes; we have been quite busy. We fed the fowls, and the geese, and the pigeons, and the ducks, and the rabbits, and we cleaned the rabbit hutches. We have been so happy! I wish you had been with us, mamma."

"And so do I, my dear," answered Mrs. Long; "but when your papa told me that he intended to take you to Mr. Lawson's, I was engaged, and I did not like to detain you till I was ready. You say you fed the pigeons; they are a new addition to the poultry-yard. Has Mr. Lawson many?"

"Yes; and they are such beauties! Some of them

have colours on the breast and throat like the peacocks. But I liked the carriers best of all. Mr. Lawson has three of them. Do not you recollect, mamma, the story of the 'White Pigeon?' Ever since I read it I have wished very much to see a carrier pigeon?"

"Are they different in appearance from the common tame pigeon, Charles? I have never seen any of them."

"I could not, at first sight, know the carrier from a grey-coloured tame pigeon; but Mr. Lawson showed me a broad circle of naked white flesh round the eyes of the carriers, by which, he said, you may always know them. He sent one of his carriers to Ramsgate, and will you believe it, mamma, it flew all that long way, more than seventy miles, in two hours and a half!"

"I can easily believe that, Charles," said Mrs. Long, "because I have heard of large flocks of pigeons that travel at a much greater rate, passing over a distance of between three and four hundred miles in six hours; that is, about a mile in a minute."

"Three or four hundred miles in six hours!" exclaimed Charles; "what famous carriers they would make! They would fly from one end of England to the other between our breakfast and dinner."

"They would certainly be able to do so," said Mrs. Long; "but, remember, I am speaking of a foreign

pigeon in its wild state. I have never heard of tame pigeons flying so quickly. Where did Mr. Lawson procure his carriers?"

"He bought them last spring when he was staying at Ramsgate," said Charles. "Fred told me they were brought home in a bag, and that his papa let one of them fly a few days after their arrival. He said that the pigeon flew up to a great height, made two or three circles in the air, and then darted off to its old home at Ramsgate. How could it know the proper direction, mamma? It had never even seen the way."

"Indeed, I do not know," said Mrs. Long; "nor do I think that any one is acquainted with the method by which birds and animals find their way in so surprising a manner. Do you know where the wild pigeon builds its nest, Charles?"

"Yes; I think you showed me last summer, mamma; on the branches of trees in the wood, just where two branches meet. Their nests are made of sticks and twigs laid almost flat. I wonder the young ones do not fall out."

"I am not surprised, Charles," said Mrs. Long, "that you should mistake those nests for the wild pigeon's. They were the nests of the *Ringdove* or *Woodpigeon*, which, though a much larger bird than the wild pigeon, a good deal resembles it. The wild pigeon, which of all pigeons is most like our English

tame pigeon, builds its nest in the holes of rocks, and old towers, and in the hollows of trees."

"Mr. Lawson showed me a pair of ringdoves, mamma, that he is trying to tame," said Charles, "but he says he does not think he shall be able to tame them, they are so very wild. They are much larger than the other pigeons, and are very fierce and quarrelsome. I saw the white mark round the back of their necks, just like a ring; but Mr. Lawson did not tell me they were called woodpigeons as well as ringdoves. What pretty creatures pigeons are! They look so clean, and their feathers are so soft. I wish I might keep pigeons, mamma."

"I am afraid, my dear, we cannot allow you; we have no suitable place for them, and I do not like to keep animals of any kind unless I can make them quite comfortable. Did you observe the pigeons drinking, Charles?"

"Yes, mamma, I did; but I should not have taken much notice of it, if Mr. Lawson had not told me to watch the fowls drinking at the same time; and then I saw that pigeons did not sip, and rest and sip, and rest again, like the fowls, but that they drank a great deal at a time, like a horse or a dog. I think all other birds that I have seen drinking, sip like the fowls, throwing their heads back every minute. What do you think, mamma?"

"I am not sure that all birds drink in that manner, but I believe it is the general habit," said Mrs. Long. "Pigeons, I know, are remarkable for drinking in a continued draught, like quadrupeds. Did Mr. Lawson tell you anything more about pigeons?"

"Oh, he told me a great deal about them," said Charles. "He showed me the two white eggs which one of the hen pigeons had laid; and he said that both parents assist in hatching them, and that both help to feed the young ones. Then, mamma, the young are not fed, at first, on the same food as the old ones, grain and seeds; but on a kind of curd, that the parent-birds can throw up from their stomachs. For three or four days, the young pigeons take this food only; then the old birds mix it with seed to give them, and at the end of eight or nine days, they eat the same food as their parents. Mr. Lawson told me, that a great number of the wild pigeons and doves leave this country in the spring. Do they go to warm countries, like the swallows?"

"No, my dear; they choose Norway and Sweden for their summer abode. These are much colder countries than our own. There are, however, many pigeons that stay the year round with us; although the chief of them migrate and return in autumn. I do not know whether they leave Norway and Sweden,

because of the severity of the winter, or for some other reason. Pigeons are found nearly all over the world; in some of the coldest countries to the North, as well as in milder climates."

"Mr. Lawson said, mamma, that there was a pigeon in America, called the passenger-pigeon, which is seen in such great flocks as to darken the air. Do not you think that he must have made a mistake? You know, mamma, there must have been thousands and thousands of pigeons flying almost close together, to have hidden the light."

"Indeed, Charles, I should have thought it very improbable," said Mrs. Long, "had I not read several accounts of these wonderful flights, by observers whose word cannot be doubted. A celebrated naturalist, Mr. Audubon, describes one flight alone as consisting of many millions. He was once travelling in America, when he attempted to reckon the flocks that passed over his head, by making on a card a pencil dot for every flock, but this he found was impossible: flock followed flock so quickly. The air became darkened, though the sun was shining brilliantly at the time; and this prodigious flight of birds continued for three days! Now, as these are the pigeons that fly a mile in a minute, the number that passed in those three days must have been far greater than either you or I can imagine."

"Oh, mamma, where could they all have found food? I think the farmers must have been quite frightened."

"The corn-fields do not suffer as you suppose, Charles," said Mrs. Long, "for the passenger-pigeon feeds principally on beech-mast, that is, the seed of the beech; and there are immense beech forests in America. The passenger-pigeon affords excellent food, and has sometimes been almost the only provision for whole armies. They are killed not only for their flesh, but for the sake of their fat, which, when melted, is used by the Indians instead of butter, and, in some parts of America, by the Americans also."

"How do the people kill them, mamma? Do the pigeons fly low?"

"Sometimes, and they can then be easily shot, or knocked down with sticks. They are also caught in large nets stretched on the ground, a tame pigeon being employed to entice them to enter. But they are generally procured in a different way. The inhabitants know that they roost in the forest, and bring up their young there. The passenger-pigeon builds the same kind of nest as our ringdoves, but lay no more than a single egg at one hatch. The pigeons will occupy whole forests of forty miles in extent, while engaged in rearing the young birds, and the ground becomes covered with branches

of trees, broken down by the weight of the birds clustering so closely together. When the people imagine that the first brood is nearly fledged, they move in large parties to the neighbourhood of those forests which the birds are known to frequent, taking with them waggons, axes, beds, cooking utensils, and sometimes their children. The noise in the woods at that time is so great as to terrify the horses, and it is with difficulty that one person can be heard by another, except by bawling in his ear. The men with their axes cut down the trees that seem to be most crowded with nests, and contrive so that as they fall these trees may knock down other trees. The tumult of the pigeons' wings sounding like thunder, mixed with the frequent crash of the timber, is described as truly wonderful.

"Then, besides these sounds, there are the cries of eagles, buzzards, and hawks, which sail about and drag the young pigeons from their nests; and the delighted grunt of herds of hogs which are feeding on the broken eggs and the young birds that have fallen from their nests. One tree will often produce above a hundred nests, and the young birds are almost one lump of fat, so that in a short time a very large quantity of oil is obtained."

"Where did you learn all this, mamma?" said Charles. "It must be a very entertaining book, I think."

"I found most of the information, my dear," answered his mamma, "in a book called Wilson's American Birds. If you like I will borrow it for you, for I have not the book. There are many parts of it which you would both understand and like."

"Was Mr. Wilson an American, mamma?" said Charles.

"No; he was a Scotch weaver, very poor, and with few friends to help him, Charles; and, therefore, though he was remarkably fond of reading, he found great difficulty in obtaining books. Still he took such pains, when he was a boy, to examine every living object around him, and to study its habits, that he acquired far greater knowledge of Natural History than those who have hundreds of books in their possession, and yet make but little use of their eyes. When he went to America, he determined to make himself acquainted as well as possible with the American birds, in order to increase his own knowledge, and also that of others. Now Wilson knew that no written description could give an accurate idea of new kinds of birds to those who were ignorant of them, and he, therefore, at forty years of age, set about with great perseverance to teach himself drawing. He travelled seven years over a great part of North America, wandering alone many thousands of miles, minutely describing the

birds he met with, and drawing their forms. He has added to the knowledge of American birds far more than any other person."

"I wish you had the book, mamma," said Charles; "I like to read things just at the time I want to know about them, because I sometimes forget to ask afterwards. But I will not forget this time, if I can help it. You are taking out your desk, mamma; I hope you are not going to write."

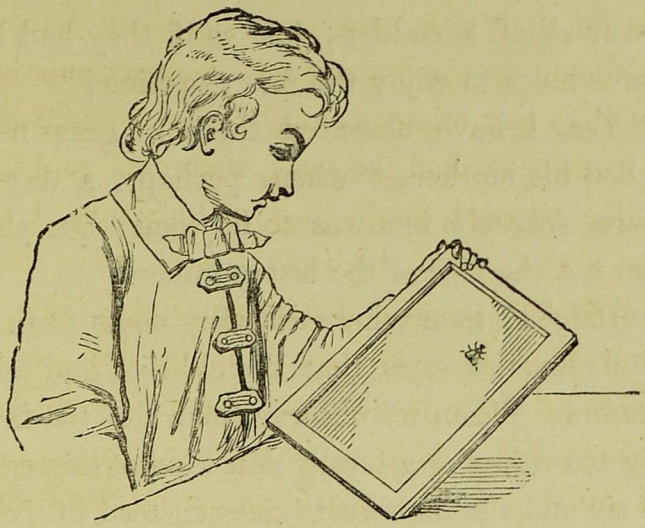
"Yes; I am obliged to write a letter, my dear, so I must beg you not to interrupt me," said Mrs. Long.

"Then, mamma, I will get the glue-pot and mend my broken cart," said Charles.

"Take care of my carpet and table, if you please," said Mrs. Long.

"Yes, mamma; I have a small deal board that I will place the glue-pot on. I will carry it from the fire very carefully."

Mrs. Long then wrote her letter, and Charles occupied himself till bed-time with his cart.



THE HOUSE-FLY.

"I WONDER, Mr. Fly, what you will do with yourself now the cold rainy weather is coming on!" exclaimed Charles Long one morning, as he was watching a fly crawling languidly over his slate. "It seems very weak," continued he, addressing his mother, who sat working at the same table. "It has scarcely strength to brush its wings, mamma. Do you know where flies hide themselves in the winter?"

"I do not think they hide themselves at all, my dear," replied Mrs. Long; "I believe most of them die before winter."

"Oh, mamma, you *must* be mistaken; where can all the flies come from, that we see on a warm sunny day in spring, if the flies die before the winter? Do not you recollect seeing hundreds and hundreds

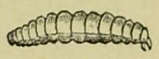
appear all of a sudden, just as if they had left their winter holes to enjoy the fine sunshine?"

"Yes, I have observed them in great numbers," replied his mother, "when, perhaps, a day or two before, scarcely one was to be seen; but these flies were not the flies of the last summer."

"Indeed! then where did they come from?"

"From the eggs that the old flies had laid in the autumn. When we observe them for the first time, they are enjoying a totally new kind of life, sporting in the air and sipping sweet juices, instead of living half-buried in manure in the form of a shapeless maggot."

"Was a fly ever a maggot?" exclaimed Charles in astonishment. "I know that a butterfly was once a caterpillar, but I thought a fly was always a fly. I have seen very little flies, mamma, and I thought they grew to be large ones."

"No, they were flies of different kinds, and would not alter in size. The house-fly is generally very common near stable-yards, or coach stands, because the eggs are laid in manure by the parent fly, as affording the best food for the young maggot when it bursts from the egg-shell. The maggot has no legs, only two little hooks near the head, to assist it in moving, or in securing its position.  When it is about to change into a chrysalis, which it does before winter, the skin shrivels, and it becomes stiff

and motionless, but the parts within grow every day more and more like a fly; at last, in the warm days of spring, the skin cracks, and the perfectly winged insect escapes from its confinement."

"I should never have thought that this delicate little fly, with its fine gauze wings, could once have been a maggot," exclaimed Charles, as he examined the fly on his slate more minutely. "Do all kinds of flies pass their young state in manure, mamma?"

"No, some pass their early life in the seeds of plants, in leaves, mushrooms, and fruits; others live in the bodies of caterpillars and different larvæ, which they entirely destroy; some feed on cheese: those little maggots, Charles, which are generally called cheese-hoppers, turn to small flies; other kinds inhabit muddy and marshy waters, and feed on rotten leaves. Some of these latter flies are particularly curious, being able to support themselves by the tail from the surface of the water, and to draw out their tails much in the same way as you would draw out the tubes of a telescope. The maggots of other flies devour the flesh of dead animals; and in hot countries these are very useful, for, from their numbers, they are capable of consuming a carcass in a very short time, and thus they destroy offensive matter. Have you ever seen the feet of a fly, Charles, through a magnifying glass?"

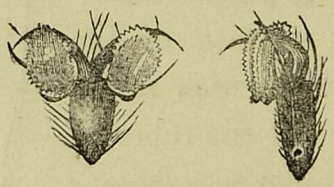
"No, never, mamma; I have often looked at the prints of them in the 'Atlas of Nature,' and wished I could see, in the real fly, the little cushions by which it sticks to the glass; and the tiny hooks which help it to cling in walking on the wall or ceiling; but I thought people could not see them except with grand microscopes."

"You, my dear, or any one else, can see them, if you wish to do so, with a two-shilling magnifying glass," replied Mrs. Long. "I will lend you my glass, Charles, if you will be careful to return it to me."

"Oh, thank you, mamma; but how am I to hold the fly steady while I look at his feet?"

"You need not hold the fly; take the magnifying glass to the window, Charles, and watch for a fly crawling on the outside, and then look at it through the pane with your glass."

Charles quickly followed his mother's direction,



and to his great pleasure soon saw the little fringed cushions or suckers, and the tiny hooks, and also the different movements of the proboscis, which amused him greatly.

DRAGON-FLIES AND WATER-BOATMEN.

Alfred and Charles Long were busy in their garden one fine summer morning, while their mother was tying up some pinks that a shower had laid on the ground. Suddenly a large dragon-fly flew over the heads of the boys, and they threw down their rakes and spades to chase it. In their hurry they nearly fell over their mother, exclaiming, as they passed her, "A horse-stinger, a horse-stinger, mamma! there he goes! there he goes! Did you ever see so large a one?"

Just as Alfred was going to fling his hat over the insect, Mrs. Long held back his arm. "You will kill it, or at least hurt it very much, my dear," said she; "wait till it settles, and then you can easily secure it."

"But if I catch it with my hand, will it not sting me?" said Alfred.

"No; fierce as it looks," answered Mrs. Long, "it has not the power to sting."

"Then why do people call them horse-stingers?" said Charles. "I always thought they stung horses."

"Because people make strange mistakes, from not carefully observing the structures and habits of insects."

"How it hovers over the flowers," exclaimed Alfred, "with its thin beautiful wings! It darts down every now and then, like the sparrow-hawk, when he suddenly drops on the small birds."

"Yes; because the dragon-fly lives upon winged insects, which it can see at a great distance. It is quite as bold, and still more voracious than the hawk. Two or three times I have seen one seize a large butterfly. There it is, resting on the laurel, Charles, with its four wings spread open. Move softly, and take it by the thick part of its body, and we will examine it together."

"I am almost afraid, mamma," said Charles, drawing back, "he is such a very large fellow."

"I will take him then," said Alfred. "Gently, gently, my friend, you must not flutter your wings in that way. I have him!"

Charles clapped his hands with glee, and ran to the large garden seat, followed by Alfred and his mother.

"What prodigious eyes he has!" he exclaimed, "and what a long thin body, Alfred! But I should not like to hold him while he keeps bending his body so. Does he not look, mamma, as if he wished to sting?"

"Yes," said Mrs. Long, "it appears like it, but the movement is only the attempt of the insect to escape. It cannot possibly sting, because it has no instrument to sting with."

"Does not the light shine beautifully on its delicate wings?" said Alfred. "The colours appear like mother-of-pearl! I have often watched these dragon-flies flitting over the surface of the ponds, and sometimes flying so low that you would think they would drop into the water."

"That is because they seize the water insects as they skim over the surface of the pond," answered Mrs. Long. "You generally find dragon-flies near ponds and ditches, both because water insects are their favourite food, and also because the dragon-flies pass their young state in the water. It is, therefore, likely that you often see those dragon-flies, which have only just escaped from their former state."

"Do you think, mamma, we could find some of the larvæ in the pond where we found the caddis-worms?" inquired Alfred.

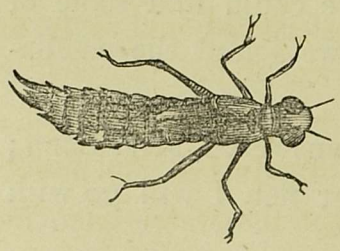
"Yes, I think we might," answered Mrs. Long; "and if you like to fetch your net, I will go with you to the brick-field now."

"Oh, I should like to go very much," said Alfred.

"And so should I," said Charles; "let the dragon-fly go, Alfred, and come and find the phials."

In a few minutes Mrs. Long and the boys were ready for another ramble to the pond, where they had so much enjoyed themselves a fortnight before. When they arrived at the edge of the pond, they saw dragon-flies sporting about in all directions, with caddis-flies, swarms of gnats, and other insects that pass their early life in the water. There were two or three of the large but thin-bodied dragon-flies, like that which they had caught in the garden, dozens of light blue and crimson dragon-flies, with bodies so slender that they looked not larger than a carpet pin, and a few with thick flat bodies, of a slate or dingy blue colour. Alfred soon put his net into the water, and, by his mother's advice, dragged it along the bottom of the pond. He drew it out two or three times without catching any insects; but at last he brought up several together, which he showed to his mother.

"You have the larvæ of two different dragon-flies in your net, Alfred," said she; "that large muddy-looking insect is the larva of the great dragon-fly like that which you caught in the garden."

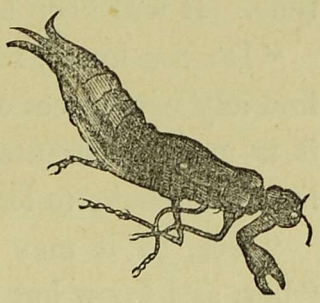


"He seems very fond of the mud," said Charles, "for as fast as you put him in the clean part of the net, Alfred, he crawls back into the muddy part of it."

"Yes," said Mrs. Long, "because it usually conceals itself in the mud, from whence it pounces upon all the insects that come in its way. It therefore likes the muddy part of the net best."

"It does not *look* as if it could move very quickly," said Charles; "I should have thought the other insects could easily escape from it."

"Because, Charles, you have never seen the curious apparatus it has for seizing its prey," replied Mrs. Long; "it has very large jaws, which are covered with a kind of mask." As Mrs. Long said this, she took up the insect in her hand, and pointed to a horny scale which concealed its face. "Look here," said she, "when the insect pleases, it can let down this mask, which is divided at the end like the claws of a lobster. When it observes its prey within reach, it darts out this strange kind of trunk, and, seizing it with the greatest celerity, conveys it to its mouth.



"Then it has a method of bringing small insects near it, that you do not know of. It has the power of drawing in and squirting out the water from its tail, by opening and shutting these five little sharp points at the tail. This motion forms a tiny current in the water, which floats small insects within its

reach. I believe, also, this action of the larva of the dragon-fly assists it in breathing, as well as helps its motion in the water. When we go home we will put this larva in a saucer of water, and then we shall see it pump the water in and out quite plainly."

"I have a little box in my pocket that will just hold him," said Charles.

"Put him in, then," said his mother, "and you had better put some of the duck-weed in at the same time. It will keep him moist till we get home."

"Do you know, mamma," said Charles, "when we find any new insect or anything else that is curious, it is much pleasanter to ask you questions than to look into books to learn about it."

"Yes, so it may be," said Mrs. Long, smiling; "but, as I know but little, you will often lose a great deal of amusement, if you are too lazy to look in a book for the information you want."

"Well, I like you to tell us *first*," said Charles, "and then I feel more interest in searching in books afterwards. What are you looking at these osiers so closely for, mamma?"

"Put down your net, and you will see," said Mrs. Long, who still continued intently watching something.

The boys ran immediately to her.

"What can it be?" said Charles, as his mother pointed to an insect on the osier. "It is alive, but I

can't make it out. It looks like an insect with two bodies."

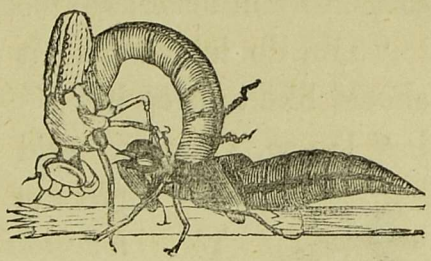
"The head and eyes are like those of the dragon-fly," observed Alfred. "Do you know what it is, mamma?"

"Yes; it is the dragon-fly escaping from its pupa state," answered Mrs. Long. "I have seen this change take place but twice before. It is very curious!"

"The pupa, in shape, seems just like the larva that we have in the box," said Charles.

"Almost," said his mother: "the only difference is the appearance of short wings folded on the back, which the larva is without. They move and eat equally in both states."

"Look! look! How he struggles to get out of the old pupa case," said Charles. "But where are his beautiful wings? These are poor miserable things, they are hardly half an inch long!"



"Because they are folded up in that small space," answered Mrs. Long. "When the dragon-fly has quite cleaned itself from the old pupa skin, you will see that it will gradually expand its wings till it is strong enough to fly."

"He is quite out," exclaimed Alfred, "how well he has managed. But I wonder the old skin does not fall. How transparent it appears now that it is quite empty. See, mamma, the dragon-fly has crawled to another stem, and seems resting himself after his fatigue."

Charles tried to remove the pupa case, but he was surprised to find it cling to the osier.

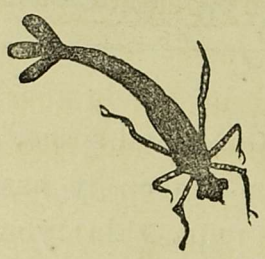
"How can that be, mamma?" said he. "The case is not alive."

"No; it is certainly not alive, Charles, but if you look, you will see that each leg has two little claws, which cling to the stem. Look, now that I have removed it, by carefully lifting each leg, it clings to my glove."

"How very perfect each part is, mamma!" said Alfred; "not one bit has been broken by the dragon-fly in his escape from it."

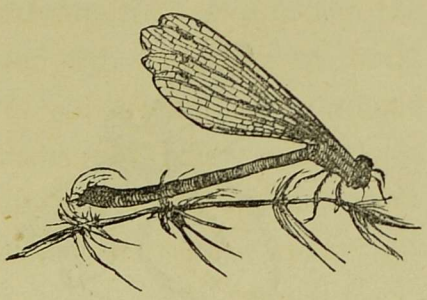
"Oh, do let us take it home," said Charles, "I should like to keep it."

"Do so, Charles," said his mother; "here is a piece of paper to put it in. Now for your net again, Alfred."



They searched the contents of the net, and Mrs. Long took out of it a slender insect, with three tails, which she told the boys was the larva of the delicate dragon-fly, that the French call demoiselle.

"Oh, you mean the small striped dragon-fly," said Alfred, "that is so easy to catch. It rests with its wings closed, not wide open, as the other dragon-flies rest."



"I like those beautiful little dragon-flies better than all," said Charles. "*They* cannot do much harm amongst the insects, I should think."

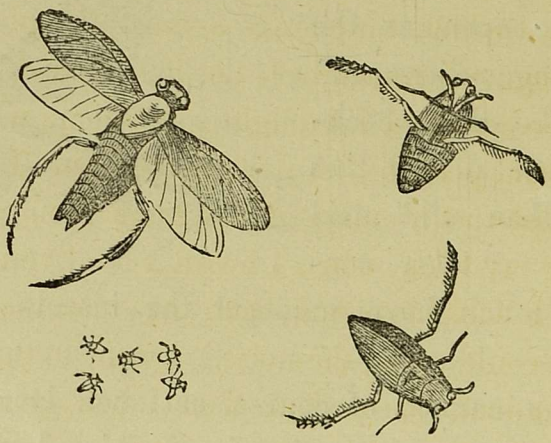
"They cannot, of course, eat such large insects as the greater dragon-flies," said Mrs. Long, "but they are equally fierce and voracious. All the dragon-flies, whether in their young or perfect state, destroy a vast number of insects. Look, Alfred, the dragon-fly has left the bush, and is enjoying himself in his new kind of life."

"I cannot find him out amongst all the others," said Alfred.

"What are these little slippery fellows, with two legs much longer than the rest?" exclaimed Charles, as from amidst the mud in his brother's net he picked out three or four insects, and placed them in a phial.

"How silvery they look!" said Alfred. "They swim on their backs, and use their long legs like oars."

"They are called water-boatmen," said Mrs. Long, "from their resemblance to a tiny boat and oars.



Their motions are so curious that I have kept three or four in a glass decanter, for more than a year, for the sake of observing them. But I was obliged to keep them well supplied with food, for they are voracious little things, and very quarrelsome. They will frequently attack and kill one another, till, out of a dozen boatmen, there will not be above three or four left."

"What large eyes they have," said Charles; "but I do not think they see particularly well with them, for they keep knocking their heads against the glass, and make quite a loud noise, louder than your watch ticking, mamma."

"They may see very well," observed Alfred, "and yet not observe the glass. Think how clear it is,

almost like the water itself. They must wonder why they cannot swim on as they do in the ponds."

"I am not surprised, Charles, that you notice the loud noise which they make against the glass," said Mrs. Long; "I remember, the first time I observed the water-boatmen, I brought some home with me in a phial, and placed it on the mantelpiece. I sat down to read in the evening in the same room, and was enjoying my book, when I heard a loud 'click, click, click.' I looked round, and saw nothing that I thought could make the noise. I went to the window and examined the sashes, then I looked under the chairs and sofa, and behind the doors. I went out of the room into the passage, but I heard no noise there, though, when I returned, the same 'click, click, click,' continued as loud as ever. At last, looking on the mantelpiece, I caught sight of the noisy little boatmen, knocking their heads against the side of the phial."

"Have the boatmen wings, in their perfect state, like the merry-go-rounds?" said Alfred.

"Yes; but excepting that difference, their shape continues nearly the same in each part of their lives," said Mrs. Long. "Those insects that have thin wing-cases, like the boatmen, only cast their skins, instead of altering their forms. During their pupa state, they have two little bumps near the head, which enclose the future wings. They swim about,

and eat as usual, and when the wings have grown sufficiently large, they throw off their skin for the last time, and become perfectly-winged insects. You can easily see that these boatmen are not covered with a shining, hard case like the beetle. Well, none of the thin-cased insects have jaws like those insects that have their wings covered with horny cases. They are furnished with a kind of proboscis, or sucker, instead of jaws; so that they do not tear their prey to pieces, but suck the juice only."

"Then, I suppose this poor fellow," said Alfred, "that has fallen to the bottom of the phial, has been killed by one of the others, and as the juice is sucked out of him, the rest of the boatmen do not care about him."

The boys now packed up the phials and net that they might be ready to return home with their mother, who did not wish to stay longer. As they were walking, Charles said, "I should like to have a curiosity-box, mamma, to put things in that I find in my walks."

"Things! Charles, what things, a tree or a gate?"

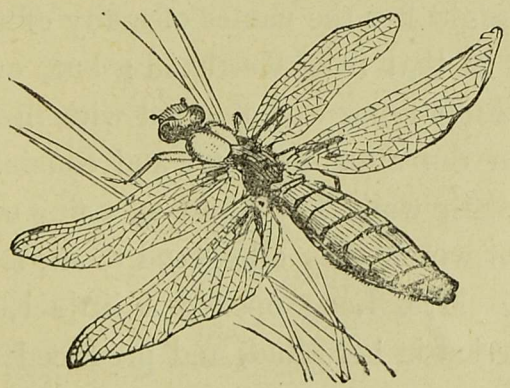
"No, no, mamma," said Charles, laughing; "you know I do not mean things of that kind, but dead insects, or curious stones, or moss, or any thing that I should wish to keep, like the pupa skin of the dragon-fly that we have found to-day. Do you think you can give me a box?"

"Yes; I think I have one that would suit your purpose," replied Mrs. Long, "and I shall be happy to give it to you. I shall like to see you make a collection, and try to learn and observe as much as you can."

"Oh, thank you, mamma," said Charles, "and you will help me, Alfred, to fill my box, will you not?"

"I cannot help you much now," answered his brother, "because you know I am going to school soon; but when there, perhaps I shall be able to send you some things."

As soon as Mrs. Long and the boys arrived at home, Mrs. Long gave Charles a box, which was a foot and a half long, and a foot broad. It was sufficiently deep to contain a shallow tray, leaving under it a space about four inches deep. His mother gave him a sheet of pasteboard to make little trays for each article; and Alfred and Charles were employed at this new occupation for two or three hours.

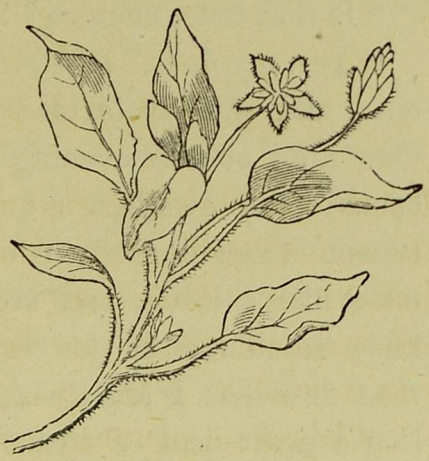


RAMBLE IN THE FIELDS.

Ellen and Sophy Morris were spending a week in the country with their Aunt Long, and her eldest son, Alfred. They were very happy, for their aunt was particularly kind to young people; and Alfred was a good-natured, agreeable boy. Their cousin Charles was absent from home.

One morning they had an extremely pleasant walk. The path led them through green lanes, over stiles, through cornfields, and a thick wood. Alfred wished to help Sophy over the stiles, but Sophy declared she liked climbing stiles herself; and she jumped over them so nimbly that Alfred pronounced her a capital climber. Ellen was collecting wild-flowers for her mamma, who lived near London, and who had taught her the names of many of the plants that grew in that neighbourhood; but, every now and then, Aunt Long was charged with the nosegay, while Ellen ran after her sister and cousin. In the course of their walk they came to a fine oak, under the shade of which they all agreed to sit, for the day was warm. Mrs. Long opened a little basket that she had carried in her hand, and produced cake and

apples, which the party thought delicious; and the basket, as Ellen observed, was now useful to carry home the flowers. As the little girls were placing the flowers in it one by one, they tried to recollect the names of several of them. "I know that is chickweed," said Sophy; "it grows almost everywhere, for I see it in the meadows, in the cornfields, and on our gravel-path at home. I give some to my bird almost every day; he is so fond of it."



"Have you ever looked at it in the evening, Sophy?" said Mrs. Long.

"No, I do not think I have," answered Sophy.

"But I have, aunt," said Ellen; "the leaves, all down the stalk, shut up in the evening, and cover the young shoots, just as if the plant were making itself warm and comfortable for the night."

"Putting on its nightcap, I suppose," said Alfred, laughing.

"Pray, Ellen, at what time does this wonderful plant wake in the morning?"

"Nine o'clock," answered Ellen, "when it opens both leaves and flowers; but it closes its flowers at

twelve again, and will not open them at all if it rains."

"Is that true, mamma?" said Alfred.

"Yes, my dear," said Mrs. Long; "many flowers open and shut their blossoms at particular hours. One kind of the evening primrose in our garden opens every evening, a quarter of an hour before sunset. The young shoots of chickweed, when boiled, taste like spinach, and are equally wholesome. I know much less of flowers than your Aunt Morris. And now that I am living at a distance from her, I lose a great deal of pleasure when I am walking in the fields. I shall try this summer to learn more about them."

"Oh, I should like to collect flowers for you, aunt," exclaimed Ellen; "mamma has taught me how to dry them between blotting-paper, and to place them neatly; and she says I do them pretty well. Mamma told me it was a good plan to dry plants, because you might forget them before you had an opportunity of seeing the living plant again."

"Indeed, I should be much obliged to you, Ellen," answered her aunt; "but be so good as to write the names of each of the flowers that you already know, and tie them to each plant, because I can then learn many particulars about them in different books."

"Yes, I will, aunt," said Ellen; "I hope I shall dry

the plants well. Mamma has a collection of flowers from Scotland, which she told me were all dried by a little boy not eight years old. Did you know that little boy?"

"Yes, my dear, he was a very clever boy. His mother was fond of examining flowers and insects, and she had taught him many entertaining things about them. He could spy out flowers on the rocks, insects on the bank, or shells on the sea-shore, far more quickly than any of us could do, or even than his mother. When he had learnt anything new about these things, he liked to tell the children who lived in the neighbouring cottages, because then they had the pleasure as well as himself. Many a time eight or ten of these children would accompany him and his mother on their rambles, hunting for curiosities. His little friends liked this occupation almost as well as he did."

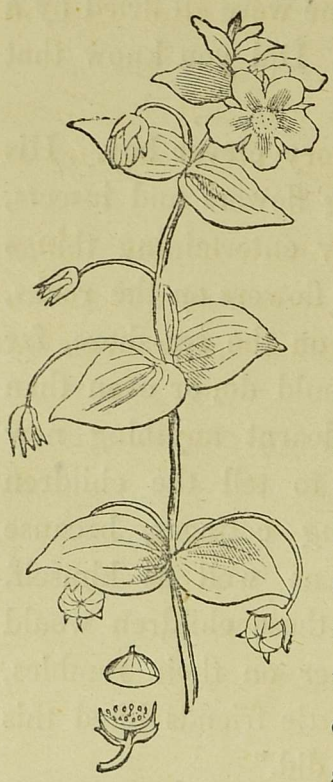
"I wish I knew that little boy!" exclaimed Sophy; "is he in Scotland now?"

"No, my dear, he lives in America with his parents. But here is a pretty scarlet flower that you have not observed; can either of you tell me the name of it?"

"I think it is called Scarlet Pimpernel," said Ellen.

"Yes," said Mrs. Long, "that is one name; the Shepherd's Weather-glass is another name that has

been given to it, because in fine weather the blossoms are open all day long; but, when the sky is cloudy and dull, the blossoms are closed."



"What pretty little green balls are hanging down the sides," said Ellen.

"Those little balls contain the seeds, and are called the seed-vessels. Before the blossom fades and falls off, they are very small, and are hidden by the blossoms, but they gradually get larger; and, when the seeds are quite ripe, the top of the seed-vessel comes off, and the seeds fall to the ground. Do you see this little line round the ball? I will lift the upper part carefully with a pin."

"It comes off just like a little cap," said Ellen, "and I can see the seeds quite closely packed. I suppose that delicate cap preserves the seeds till they are quite ripe. How very curious!"

While they were examining the Scarlet Pimpernel, they heard a rustling over their heads, and, looking up, they saw Alfred among the branches of the great oak, filling his hat with something.

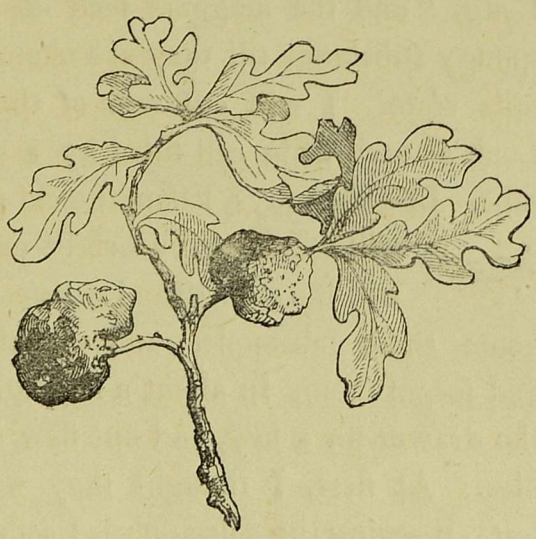
"What are you doing, Alfred?" asked Sophy.

"Picking something for you, my dear, ripe and rosy," answered Alfred.

"Something for me—what can that be?" said Sophy; "there are no acorns yet; besides, they are not rosy."

"I know what you are gathering," said Ellen; "they are oak-apples; I have seen boys with them."

"What are they like?" called out Sophy; but, before she had finished speaking, twenty or thirty oak-apples came rattling on her straw hat, and fell all around her.



"Oh, what a number!" exclaimed Sophy. "Why they are like crab-apples, but some are a great deal larger How pretty and red they are!—are they good to eat?"

"No, not at all, Sophy," said Ellen; "they are only called oak-apples because they are so much like the fruit; but I do not know what makes them grow on the oak. We will ask my aunt."

Mrs. Long told them that the oak-apples were occasioned by a small insect that lays its eggs in the leaf-bud in the early part of the spring. The natural growth of the bud is thus checked, and the bud then gradually swells into a round form like an apple.

"But do the eggs stay there always?" asked Ellen; "do they never come out?"

"They are hatched inside the apple," said Mrs. Long, "and the maggots feed on the juices of this spongy substance till they are changed to their chrysalis state. I will cut one of the apples through. Look at each little cell filled by a white fleshy chrysalis. In a few days, Ellen, the skin of each chrysalis

will crack, and a bright-yellowish brown fly will burst forth. Last year, Alfred brought home some oak-apples, and put them in a drawer and forgot them. In about a fortnight after, I went to the drawer for a key, and out flew dozens of delicate flies. At first, I thought they were winged ants, but, on seeing the oak-apples, I soon discovered what they really were. The oak-apples were bored full of holes, from some of which the flies were still creeping."

"I shall keep some of these oak-apples, aunt," said Ellen, "that I may see the fly. I can keep them in a box in the tool-house at home."

"There are different kinds of swellings found both upon the oak and upon other trees," said Mrs. Long,

"All these swellings are called galls, and the insects gall-flies. There is one gall that is found on the leaf of the oak, which is as hard as wood, except just in the centre, where one maggot lives and thrives. This kind of gall is used in large quantities for dyeing a beautiful purple and also a black colour. It is found in England; but the best kinds come from the eastern shores of the Mediterranean Sea. They are considered most valuable before the insects have pierced them."

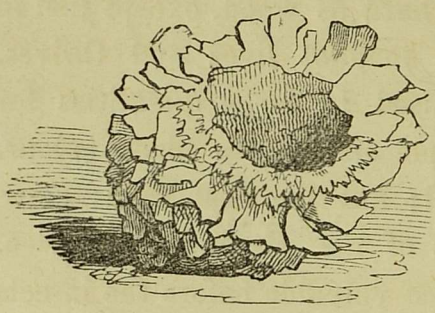
"I did not know before that the oak was so useful, aunt," said Sophy. "The wood is used for building ships, the bark for tanning, and the galls for dyeing."

"There are other parts of the oak that are useful, besides those you have mentioned, Sophy," said Mrs. Long.

"You mean the acorns, aunt, that are given to fatten pigs," said Ellen; "and I think I have heard, too, that acorns have been sometimes used for bread."

"I believe they are now used for that purpose in the South of Europe, Ellen," said Mrs. Long, "amongst the very poor. But the oak that bears the edible acorn is not the same as our English oak. That acorn is much more agreeable to the taste, and far more nourishing. But, besides the acorn, there is another part of the oak that is

useful. The acorn-cups of an oak that grows in Turkey are used for tanning, and are more valuable for that purpose than the bark, because they contain more of the strong bitter quality called tannin. Leather can be tanned with these acorn-cups in less than half the time required by the use of bark. They are very large, and covered with spines, but the acorn itself is not large. They are known by the name of 'Valonia,' and large cargoes come every year to this country. The oak itself is not unlike our English oak, only more stunted, but the leaves are smaller. The people in the East gather the Valonia in the month of October, knocking the cups down with long poles and picking out the acorns by means of a hooked nail."



"Have you ever seen a tanyard, Sophy?" said Alfred.

"Oh, yes, often. How disagreeable it smells. The pits are full of bark and water, and skins to be tanned. But, aunt, why do tanners use bark at all, if the Valonia is so much the best?"

"Because bark is so much cheaper," said Mrs. Long. "The Americans use the bark of many

other trees as well as of the oak for tanning. But look at your sister; she is watching something on that hedge."

"Oh! don't move! don't make a noise!" exclaimed Ellen suddenly, in a low voice, as Alfred was letting himself down from a branch of the oak where he had been swinging; "look at that small brown bird flying into the hedge—what is it?"

"Where—where?" whispered Alfred; "I do not see it."

"No, because it is hidden in the thick part of that hedge. Wait a moment: do not stir. There it is, on that twig. It is of a dark reddish-brown colour, with a fine crimson breast. What is it, Alfred?"

"I am not sure, but I think it is a linnet," answered Alfred.

"But the linnet that I have seen in a cage," said Ellen, "is of a brownish colour, and has only red speckles on its breast; it has not that beautiful carmine tinge, has it, aunt?"

"No," replied her aunt; "but, in a wild state, the plumage is much more brilliant. It also varies considerably at different seasons of the year, so that I am not surprised, Ellen, that you do not know the bird again. I have no doubt it is a linnet, from its slender form, as well as from the colours that the male linnet always assumes at this period of the year. I suppose the nest is not far from us, by the bird's

keeping so near to one spot. If we do not disturb it, we may hear it sing. The male linnet usually sings to his mate, while she is occupied in hatching the eggs. The latter part of May is generally the time for the first brood, and this is the last week. Hush! he is singing. How sweetly it sounds!"

"But does not the mother bird sing too?" said Sophy.

"Very little indeed," answered Mrs. Long; "but she builds the nest, and watches with patient care the hatching of the eggs, while the male linnet assists in neither. No sooner, however, is the nest finished, than he becomes as patient and as watchful as his mate. He hourly cheers her with his song, and feeds her with the greatest attention, pecking various small seeds, which he swallows, and brings again into his bill, in a soft state, before he offers them to her. If anything alarms him, he flutters from bush to bush, uttering a plaintive cry, as he did just now, when our noise in talking frightened him. If we had not lowered our voices, he would have redoubled his cries till his mate had left the nest, when they would have flown off together."

"How much I should like to see the nest!" said Ellen.

"But we should frighten the old birds," said little Sophy; "and I think that would be cruel—do not you, aunt?"

"No, my dear, I do not," answered Mrs. Long; "we can move gently, and stay but a few minutes, and then the old birds will soon return, even if we do frighten them away. It is very curious to observe the different ways of building nests, and I like to examine them as much as your sister Ellen does."

"I thought all nests were built alike," said Sophy.

"Oh! oh!" exclaimed Alfred, "you have forgotten the great crow's nest I showed you yesterday, Sophy, and the mud nest of the martin. The linnet's nest is quite different from either of them."

Mrs. Long, the two girls, and Alfred, then stepped softly to the hedge where the linnet was singing, but the noise was quite sufficient to startle him, and, uttering his note of warning to his mate, he flew to a neighbouring tree. Ellen and Sophy had just time to see the bright brown twinkling eye of the mother bird, as she anxiously listened to the cry of her mate, before she flew from the hedge to follow him.

"Oh! what a beautiful little nest!" exclaimed Sophy: "and there are five white eggs in it, spotted with small red marks."

"I never saw a nest before," said Ellen, "except when the young birds were fledged, and then the nest is always soiled and torn, quite different from this neat little nest. You cannot think, aunt, how smooth and soft the inside looks. It is lined with wool and horse-hair, and a kind of downy stuff, and the outside is

made of straw and small roots;—pray look at it, aunt."

Mrs. Long thought the nest as beautiful as her nieces described it to be. She told them that the soft downy lining was plucked by the linnet from the feathered seeds of flowers, such as groundsel or dandelion. She said she was not surprised at Ellen's admiring the smoothness of the inside of the nest, for the linnet had been called one of the weaving birds, from the manner in which it fastens the materials of the lining. Mrs. Long told Ellen to observe how the horsehair was used by the linnet, the ends of it being all bent into the outer wall of straw and roots, so that no end should touch the young birds. "And neat and pretty as this nest is," added she, "there are other small nests that are much superior in workmanship to those of the linnet."

"I wish I could see the young birds when they are hatched, but I shall be at home before that time," said Sophy, in a sorrowful tone.

"Well, Sophy," said her aunt, "as you will not be able to see them, I will tell you a story about some linnets, to console you."

"Oh! thank you," said Sophy; and in a minute Alfred, Ellen, and Sophy were again sitting round Mrs. Long under the tree.

"I must first tell you that linnets are easily tamed, and that they seem to dislike confinement less than

most birds. They become very much attached to persons who are kind to them. They soon become acquainted with those who feed them, and if the door of the cage is left open, will immediately fly towards their friends, perch on their shoulders or fingers, rub their little heads against them, and try, in every way they can, to show their affection. Linnets can be taught to imitate sounds; and if brought up with a nightingale or a lark, will learn to sing like them. But, still more surprising, linnets can be taught to speak! A certain Italian gives an account of a linnet that used to call several persons by their names, as well as to whistle many tunes. This remarkable bird lived to be forty years old, and died at last by an accident."

"But, aunt," said Ellen, "the linnet could not really understand what it said, though it could repeat some words like a parrot; could it?"

"No, my dear; it only imitated the sounds of names, in the same manner as it learnt the tunes, by hearing them constantly repeated. Now for the story:—In the Orkney Islands, a few years ago, there lived a gentleman of the name of Strang, who was very fond of examining birds and their habits. His children, I suppose, had heard what a gentle, affectionate bird the linnet is; and happening one day to see, in a furze-bush, a nest of young linnets, nearly fledged, they thought they should like to bring them up, and tame them. The children did not

reflect upon the sorrow the parent birds would feel, when they should see their young ones stolen from them, or I do not think they would have taken the nest. The old birds heard the young ones chirp loudly for help, and followed the little party, hovering and fluttering over them. On arriving at home the children took the nest up-stairs, and placed it on the window-sill, outside the window. What was their surprise and pleasure to see the old birds appear, and immediately begin to feed their young, without showing the least alarm. The children soon called their father to come and watch them; and he took the nest and placed it on the table, in the middle of the room, and then left the window open. After a short time, the parent birds came boldly in, and fed the young ones, as before. The nest was then put inside a cage, which was placed on the table, with the door open. To the astonishment of every one, the brave parents returned, entered the cage, and supplied their young with food; and even hopped about the cage, and chirped to their little ones, regardless of the noise of the children. The cage was then hung outside the window; and for several days the young birds were constantly fed by their parents, to the great delight of the children. Unluckily, however, an accident happened, that made the young people wish that they had never touched the linnet's nest. A violent shower

of rain came on, so suddenly, that the family, who were all down-stairs at the time, were not able to run up-stairs to take the cage in, before the poor little birds were all drowned in their nest!"

"Oh, what a pity!" exclaimed Sophy; "poor little things! did the parents see the accident? What did they do?"

"I do not know whether they saw the accident," answered Mrs. Long; "but they showed every sign of anxiety, when they observed that their young ones were gone. They hovered near the house for several days, uttering repeated cries to their young, and then they disappeared."

"But, aunt," said Ellen, "do not you think that the young birds would have been killed, just the same, by the heavy rain, if they had been left in the hedge?"

"No, my dear, I do not," answered Mrs. Long; "for the branches of a hawthorn hedge, or a furze-bush, where linnets generally build, are so close together, and the leaves so numerous, that I think the rain would not have penetrated. The cage, hung against the side of the house, had no protection."

"Do you know, aunt," said Ellen, "that while you were telling us how nicely the old birds fed the young, I wished very much to have a nest of young linnets, but I do not wish it now. It would have made me very unhappy to have seen the poor little drowned birds; and I have heard mamma say that

young birds most frequently die when taken from their parents."

"It is generally the case, Ellen," said Mrs. Long; "for they have seldom the proper food given them, nor are they kept sufficiently warm. Birds have rarely been known to be as courageous as these linnets were. I never heard of more than two or three instances."

"Do linnets leave this country in the autumn, like the swallows, aunt?"

"No, my dear," said Mrs. Long; "they unite in flocks, towards the end of September, but not to migrate. They fly together, rise and fall at the same time, and fix on the same trees. They pass the night in the woods, generally choosing to perch on the branches of an oak, because the leaves, though dry, remain on the oak nearly all the winter. They feed, not merely on seeds, but on the young buds of limetrees, poplars, and birch. In the beginning of spring their beautiful song is again heard; and they then separate into pairs, and do not assemble together again till the following autumn."

"I shall go to that bank, aunt, now you have done your story," said little Sophy, "and gather some of those grasses for mamma. Look how pretty they are; they wave about in the wind like feathers. Mamma used to put the delicate grasses that we found, in our walks last summer, into vases; and I

think she would be glad of some fresh ones. I shall pick a good bunch."

While Sophy was occupied in gathering the prettiest grasses she could find, Alfred asked his mother whether she had heard the gentleman, who had called on his father the day before, speak of the beautiful imitations of Leghorn hats that he had seen made from English grasses. "I was so sorry, mamma," added he, "that I was obliged to go to school just at that time."

"Yes; I was sorry, also; for Mr. Prescot gave us a very interesting account of the Italian manufacture. He left your father a little book on the subject, which I will show you; and the grasses which your cousins are now gathering will assist us to understand it."

"Here comes Sophy with the bunch in her hand," said Mrs. Long. "You have chosen some beautiful kinds, Sophy; but I can afford you no more time, for we must return home, or else we shall keep your uncle waiting dinner for us."

AUNT LUCY'S RETURN FROM WOODVILLE.

"I AM so glad you have come back from Woodville," exclaimed Arthur Campbell on the first evening of his aunt's return. "I thought you would never come home, you have been such a terrible time away."

"Only four months, Arthur, and they have not been terrible to me; they have been exceedingly pleasant months; but I am very glad to see you all again."

"We have been looking out of the window such a long, long time for you," said little Emily. "It got quite dark, and then we watched the lamplighter light every lamp in the street. I told Arthur you would not come to-night."

"Ah, but I heard the horn," said Arthur, "and then I thought it must be your stage-coach coming."

"Arthur and Emily have been wishing for your return," said Mrs. Campbell, "almost as much as I have. I do not know what we should do this winter without Aunt Lucy. It is quite pleasant to see you in your old place again. Arthur, my dear, ring the

bell for tea; your aunt must be quite fatigued with her journey."

During tea, Arthur stood by his aunt's side listening to her conversation with his mother, and attentively handing her the tea and toast. In compliance with his mother's desire, he heroically deferred every question respecting Woodville, until the tea-things had been removed. As for Emily, she sat on a cushion at her aunt's feet, and seemed to find quite pleasure enough in watching her aunt sip her tea. She was quite sure that her aunt had returned, and that was all she thought of.

When the tea-things had been cleared away, Arthur exclaimed, "Now, Aunt Lucy, I may speak; do tell us all about our cousins. You know I have not seen them since I was quite a little boy, and I should like you to tell me everything you can about them."

"That would take me a long time indeed," said his aunt; "but I dare say I can tell you something to amuse you. Your cousins used to ask me to tell them about you and Emily."

"Did they? I thought Sydney would never care about such a little fellow as I am. He must be quite a big boy now!"

"Yes, he is eleven, and you are only eight, I believe," replied Aunt Lucy; "but that did not prevent his liking to hear me talk about you. He

is a good-natured boy, and very kind to his brothers and sisters."

"And how old are they, aunt?" said Emily.

"Edward, the second boy, is nine; Caroline is a little older than you are, Emily, seven and a half, I believe; and Julia is just four. When I first went to Woodville, I was much amused with their love of Flora, the pretty little spaniel that your papa gave them last year."

"Oh! I remember Flora," said Arthur; "she had a beautiful brown skin, and long silky ears."

"Yes, her ears are very beautiful," replied his aunt. "Well, all the children are fond of Flora; she is quite their little play-fellow; but Sydney is her great friend. He regularly feeds her; and she, in return, sleeps at his door at night, follows him to school in the morning; and when he plays at cricket, or other games, she sits on his jacket to guard it, till he is ready to put it on again."

"Good Flora!" said Emily: "Sydney must be fond of her."

"A few days after my arrival," continued her aunt, "Flora had four pups, which she nursed with a great deal of care."

"Nursed!" said Arthur, laughing. "Why, aunt, Flora did not take them up and dance them in her paws, did she?"

No, Master Arthur Sharp, but she took care,

when they were feeble and helpless, that they did not get into any danger; and she licked them clean, and kept them warm at night."

"What were the colours of the puppies?" said Emily.

"Two were very soon given away," replied her aunt, "and I forget their colour; but one of the others was of a light brown colour; the remaining one being of a much darker brown, but spotted with clear white. Your cousin Edward made a little sledge, to which he harnessed Flora, and by degrees he taught her to draw it quite steadily."

"How did he manage that?" said Arthur, "I have tried again and again to make Dash draw my great cart, but he never will."

"Edward did not succeed at first better than you; but Sydney thought of a plan. He harnessed Flora to the sledge at one end of the garden, and placed her puppies opposite to her at the other end. When Flora saw her puppies, she quickly set off to join them. Then Sydney and Edward patted her, and gave her some milk for her trouble. Little Julia frequently used to ride the puppies in the sledge, holding them, that they might not fall over."

"I should have liked to do that," said Emily.

"We thought we should have lost Flora one day," continued Aunt Lucy, "for she was so ill that she nearly died. We were walking out together with

your uncle and aunt, and, much to the children's surprise, Flora had not followed us. I suppose we had been out two hours, and were returning home, when one of the servants came running towards us, and exclaimed to your uncle, 'Oh, pray, sir, come home directly; poor Flora is dying; she has been poisoned, and none of us can do anything for her.' You may be sure we all hurried home as quickly as we could; and as for the boys, they never stopped running till they reached the house. There lay poor Flora, with her tongue hanging out, her legs quite stiff, and breathing violently."

"Oh, Aunt Lucy, what was the matter with her?" said Emily; "was she really poisoned?"

"How fortunate that my uncle is a doctor!" exclaimed Arthur; "I dare say he soon gave her something to cure her."

"On seeing her, Arthur, he thought it would be better to destroy her, to put an end to her sufferings; but he determined first to do all he could to save her life. He gave her castor oil and other medicines, but they did not appear to relieve her pain. It then struck him that she was dying from suffocation; so he made an opening in the windpipe in her throat."

"Oh, did not that kill her?" said Emily.

"What is the windpipe, aunt?" inquired Arthur; "I do not understand you; I thought people and animals always died if their throats were cut."

"Yes, so they do, Arthur, if a large vein be cut that is very near the windpipe, but your uncle knew how to avoid that. The windpipe is a pipe through which both men and animals breathe. Air is continually passing up and down it. At the top of this pipe in the throat is a little valve or door, made of skin, which closes when we swallow, so that not the smallest thing can get into it to prevent our breathing freely. If that pipe were to get completely stopped up, we must die. It does sometimes happen, however, although very seldom, that this little door does not shut quickly enough; and this was the case with poor Flora, as you shall hear.

"After your uncle had cut the slit in the windpipe, Flora's breathing became so easy, and her limbs so pliant and tranquil, that we plainly saw that her pain was greatly relieved. Still, instead of getting better, she seemed to become more feeble, and at last she was so quiet that we almost feared she was dead. Sydney, who was leaning over her and assisting his papa, could hardly keep in his tears, when, happening to exclaim, 'My poor dear Flora!' she slightly opened her eyes and moved her tail, to acknowledge his well-known voice."

"Dear aunt, do go on, if you please," said Arthur. "What did my uncle do next?"

"Finding that no substance was sticking in the lower part of the windpipe, he put the handle of a

small spoon into the upper part of the windpipe, from the wound towards the mouth. He immediately felt something rough, and in an instant Flora coughed, and out came a small gristly bone, which had been wedged into the upper part of the windpipe."

"Oh, how glad I am!" said Emily. "Did she get well directly, aunt?"

"No, poor thing! she looked almost dead. Your uncle and Sydney poured a little warm milk down her throat, and placed her in flannels before the kitchen fire for the night; but she was so exhausted that they scarcely expected to find her alive the next morning. All the children went very grave to bed, for they loved Flora, and were very sorry to see her sufferings. When Sydney came down in the morning to see after her, which he did before six o'clock, to his great surprise he found her in the washhouse with her puppies. Feeble as she was, she had crawled to them."

"Dear, good Flora! she did not forget them, mamma," exclaimed Emily. "Do not you love her? I do."

"Pray, Emily, do not interrupt Aunt Lucy," said Arthur. "I want to know whether Flora got quite well, and whether the hole in the throat was always left open."

"No, Arthur, it was sewed up a day or two after the accident. Flora soon ran about, feebly at first,

but in a few days she seemed pretty well, and long before the hay-making time, she was able to play with your cousins as merrily as ever. It was quite pleasing to see her run to your uncle. She seemed to know that he had cured her; and at the least sound of his step, or of his voice, she would dart to meet him, spring on his knee, and do everything she could to show how glad she was to see him."

"But had not she been fond of my uncle before?" said Arthur.

"Not particularly; she used generally to be with the children; but now, excepting Sydney, she likes your uncle better than anybody. Her bark is different to what it was before the accident. It sounds hoarse and thick, and is not likely to recover its old tone again. Now I will tell you about Julia's rabbit.

"We were walking one day in a pleasant park, where there is a rabbit warren—that is, a place where a great many rabbits live in holes under the ground. We stood for some time opposite a bank which was full of their holes, watching the rabbits pop in and out from their narrow passages. Some were so frightened when they saw us, that they seemed as if they could hardly run away fast enough, striking the ground with their hind legs, and darting into their holes as fast as possible. The little ones, that could not follow their mothers quickly enough, rolled

down the bank like little lumps of soft down. Julia was so delighted with watching them, that she did not like to leave them; and every time we attempted to continue our walk, she begged us to stay "only one minute more." A good-natured boy, the son of the owner of the park, happened to be fishing near, and seeing Julia's pleasure, he asked her whether she would like to have a rabbit; and in a few minutes he caught her a young one, quite white, excepting a few black spots."

"I think that was very kind of him," said Arthur; "how much pleased Julia must have been."

"Yes, she was so happy with her rabbit, that she would let no one carry it home but herself. She turned her frock up in front, and carried the rabbit in it. Then every now and then she stopped, to see that it was quite safe."

"But when she got home, aunt, who took care of it?" said Emily; "Julia could not clean the hutch herself."

"Her brother Edward cleaned it for her every day, besides washing it twice a-week; and he took a great deal of care to let it be well dried before he put the rabbit back, because rabbits will often die if their hutches are damp. Edward was so much amused with Julia's rabbit, that he bought two of a farmer for himself; and then he had a great deal more trouble, for he never neglected Julia's rabbit. Sydney made

the hutches for him of two large boxes, and some pieces of railing about a foot high, that had once separated their little gardens. Your cousins were much pleased when one of the rabbits had young ones. The mother rabbit made a comfortable warm bed for them. First she bit the hay into very small pieces, and then she tore the soft hair off her stomach to line the nest, that not even the hay might touch their tender skins."

"I wonder Sydney did not like to keep rabbits," said Arthur. "I should very much."

"Oh, Sydney was very busy with his fish and white mice," replied Aunt Lucy. "He had two large wooden troughs of water in his garden. In one he kept a great many sticklebacks, in the other some very good-sized carp. Their silvery sides used to look beautiful in the sunshine. He had built little grottoes at each end of both the troughs, so that at the least alarm, or when the sun was too warm for them, the fish could conceal themselves among the stones. On these stones he planted some water-plants, which keep the water pure; and occasionally he put in a little fresh water. When I left Woodville, the fish all looked thriving, though he had had them more than three months."

"I should have liked the rabbits far better than the fish," said Arthur. "Fish are such stupid silly things, you cannot make them know you."

"Sydney hoped he should be able to make the carp know him," replied his aunt. "He had read in some book that Sir Joseph Banks had a fish-pond stocked with carp; and that he could bring the carp to the surface at any time by ringing a little silver bell. Sydney thought he would try to call them by whistling."

"And did they come to the top of the water when he whistled?" said Emily.

"No; I think they generally rushed under the stones; but a few crumbs of bread soon brought them to the surface. Perhaps Sydney ought to have procured very young carp, and they might have learnt to attend to his whistle. I myself have heard of several kinds of fish that appear sensible of sounds. I have read of a person at Rotterdam who kept, in a moat, some carp which he could call up at his pleasure. He generally fed them with spinach seed. While he remained quiet, not a single fish appeared; but the very moment he made his usual call, the carp gathered together in such numbers that there was scarcely room for them to lie by one another; and then he flung his spinach seed among them, which they devoured greedily. In many parts of Europe, gold and silver fish are called to the surface of the water by ringing a little bell. In Germany, a fish named the chad is taken by means of nets, to which bows of wood, hung with

little bells, are attached, in such a manner as to make a pleasant sound when the nets are moved. The chad, when once attracted by the sound, will not attempt to escape as long as the bells continue to ring, and they are, therefore, very easily secured. I believe, also, in our own country, at Uxbridge, there is a pond of pikes, the fish in which may be called at pleasure. So that, I think, if Sydney had taken the proper means with his carp, he would have succeeded. The water was too often disturbed by the boys, who sailed their small boats on the water, and by Sydney's pretty steam-boat."

"Oh, aunt!" exclaimed Arthur, "had Sydney a real steam-boat, with smoke coming out of the chimney, like the large ones?"

"It was built like a steam-boat, Arthur, with real paddles on the sides, that went round and round in the water, and smoke very often came out of the chimney; but yet it was not a real steam-boat, because it was not moved by steam, but by two little white mice."

"Oh, how? Do tell me. I wish I could see it," said Arthur.

"In the middle of the boat there was a little round wire cage, like that which you have seen squirrels kept in. There was a small hole at each end of the cage, and two small wires fixed in the paddle-wheels fitted into these holes. When the

mice were placed inside the cage, they tried to climb just as the squirrels do, in their round cages, and that set the cage spinning and turned the paddle-wheels; and then the little boat went steadily on."

"How pretty it must have looked!" said Emily.

"But how did they make the chimney smoke? You have not told us that," said Arthur.

"Oh, that was make-believe," replied Aunt Lucy. "Before the steam-boat started on her voyage, the boys used to dip a little bit of cotton in oil and light it. Under the chimney was a little tin box, in which they put the cotton after they had blown the flame out. The smoke came out of the chimney for a long time afterwards."

"I should have liked that steam-boat and the white mice, aunt, better than the rabbits, or the fish, or anything else," said Arthur. "How frightened the poor carp must have been, when they saw and heard the paddles come splash, splash, through the water."

"Had Caroline nothing to take care of, aunt?" said Emily. "You have not told us anything about her yet."

"Have I not? Oh, Caroline had her favourites also; she liked her magpie best of all; but she was obliged to give him away, Emily, for she could not teach him good manners. He not only stole several things, but he took a great dislike to little Julia, who one day, frightened at his hopping after her

had foolishly thrown her ball at him. After that, he never saw Julia enter the garden but he strode along with his side-long hop to peck at her legs; and one day he hurt and frightened her so much, that Caroline would not keep him any longer, but gave him away to a farmer who had no children. Then she had a tortoise."

"A tortoise! that is the animal which has a hard horny shell. Mamma's combs are made of it," said Emily.

"No, the shell of the common garden tortoise is not used for that purpose, Emily. The tortoise-shell that you have seen comes from the back of a tortoise or turtle that lives in the sea. Its large horny case is divided into separate pieces, and is not, as in the case of a garden tortoise, one solid covering. The garden tortoise does not live in the water, at any time. It is a heavy, dull animal, and feeds upon slugs and snails, and is only awake half the year. Before I came away from Woodville, Caroline told me he had buried himself for the winter, and that she should not see him again till the warm days of spring."

"Will not he eat all that time, aunt?" said Arthur.

"No; he will sleep, like the frogs, and many other animals. When he settles himself for his long nap, or when alarmed, he can protect himself better than almost any other animal.

"His stomach and back are well defended from all attacks by the hard case, which is so strong that, even if you were to stand upon it, you would not injure it. Then his legs are covered with hard horny scales; and, when he draws his head under his shell, he quickly closes the entrance, by folding the front legs over it. You might then roll him about, and he would not move. Sydney said that the tortoise, in summer time, was almost as useful as a weather-glass."

"How was that, aunt?" exclaimed Arthur. "Could the tortoise show when the weather was likely to be fine or wet?"

"Yes, in a great measure," replied Aunt Lucy; "for tortoises have so great a dread of rain, that at the least sprinkling they will endeavour to hide themselves in the first corner they can find. They will creep into their holes at every shower, and not stir at all in wet weather."

"But, aunt," said Arthur, "the weather-glass shows us whether it will rain *before* it begins."

"And so, also, will the tortoise, if his motions are closely watched," replied Aunt Lucy. "If, in the morning, he walks rather briskly, on tip-toe, as it were, and seems to be feeding eagerly, you may be almost sure that it will rain before evening, and that he is preparing for being kept at home."

"It is very strange that he should care about the

rain," said Emily, "with that thick shell on his back."

"Yes, unless I had seen how often your cousin's tortoise shrank from the slightest shower, I could not have believed how much he dreads it. I am not surprised at his seeking to avoid the hot sunshine in summer, because, if the shell were once heated, it would hurt the poor animal very much."

"Then, in a hot summer day, does he bury himself in his hole?" said Arthur. "He must spend almost all the year underground!"

"He spends a very long time there, certainly," replied Aunt Lucy; "for even in summer he retires to rest at four in the afternoon, and does not stir till late in the morning. But he does not generally shelter himself in the hole during the heat of the day; he more usually seeks the shade of a large cabbage-leaf, or lies amidst the waving stems of an asparagus bed."

"I should like to keep a tortoise," said Arthur, "though he is such a lazy fellow. I have seen Italian boys with them in the streets. Do you know, Aunt Lucy, where these boys get them from?"

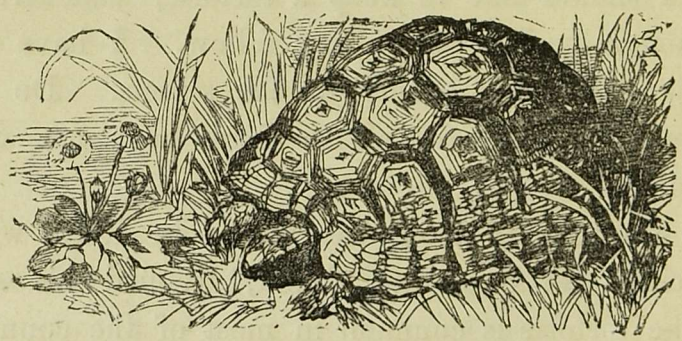
"Very likely from the woods in Italy, where tortoises are frequently found," replied his aunt. "The tortoise is common in most of the countries near the Mediterranean Sea. It is sold in the mar-

kets of Greece, Italy, and Egypt, as an article of food; and its eggs, which are about the size of a pigeon's, are considered delicious."

"I wish I might go to Woodville next summer," said Emily. "I should like so much to see my cousins, and all their entertaining animals!"

"Oh, I have not told about half their favourites yet," said her aunt. "There is old Bess, the stable cat, who sleeps upon Punch's back every night; and robins, and pet lizards; but I must talk about them another evening, for I see mamma pointing to her watch, and I think we have been chatting more than an hour later than your usual bed-time."

"Oh, I am sorry bed-time has come," said Arthur, looking very loth to depart. "I am coming in a moment, mamma; I must just tell Aunt Lucy one thing." And, after whispering some important secret in his aunt's ear, and giving her what he called a proper hug, he ran after his mother and Emily.



THE GREAT WATER-BEETLE.

The little museum of Charles Long gave his brother quite as much pleasure as Charles had hoped it would. Alfred not only admired it exceedingly, and examined every object minutely, but he was as desirous as his brother to add to the collection.

Thus the two boys had always some pleasant object in their walk which equally interested them both.

Sometimes they climbed old decayed trees, to search amidst the crevices of the bark for several insects which frequent these spots, or to examine the deep holes where the fine rotten powder of the wood formed a place of concealment for various kinds of caterpillars, during their pupa state.

At other times the brothers raked and fished along the edges of small streams, searching for fresh-water muscles, hoping to find the English pearl; or for spiders, and other insects which skim lightly along the surface of the water, not by swimming, but by actual walking. In searching for one thing, many other curious objects, well worth observing, were often found.

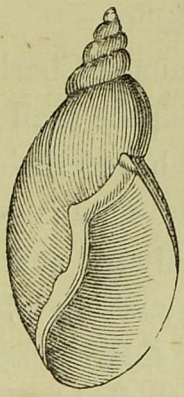
When the boys wished to extend their walk after

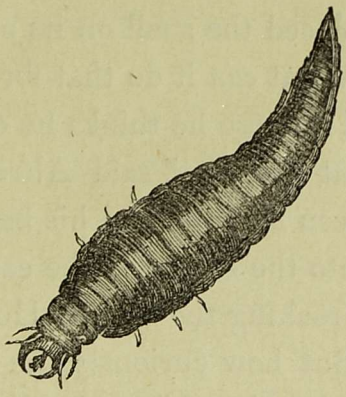
they had collected as many objects as they cared for at the time, they used to form a kind of dock by damming up the mud of the stream or pond into a circular bank, and then deposit the different things till they returned. They took good care, however, to separate the larger insects from the others; for some they found were so voracious, that the smaller easily fell a prey to them.

On one of these exploring occasions Alfred and Charles went to a neighbouring pond to search for the long taper water-snail that creeps along the surface of the water, precisely as the common snail does on land, with the difference only of having the shell and body reversed. They soon found the object of their walk. The day was fine and warm, and the snails were not particularly active. They appeared to find quite enjoyment enough in reposing on the leaves of the water-lilies, or in suspending themselves from the surface of the clear pond. Whole clusters of them, of every size, were in these positions. Suddenly there appeared a commotion among some of them, and one after another quickly let itself drop to the bottom of the pond, while those on the rushes, or water-lilies, attempted to crawl hastily away.

What could occasion these movements? It was some time before either Alfred or Charles could find out.

At length Charles exclaimed, "I see, I see! There is a leech, a great leech got among them; look, Alfred, there he is twisting and turning round that poor snail, and he has buried his head right in the body, as if he would devour every morsel. There, the shell of the snail is floating away quite empty. Do not you see the large black fellow near that tall water-plantain?"





"Yes, I see it now," replied Alfred; "but I do not think it is a leech. It is some kind of insect that we have never seen before. Let us catch it."

The net was ready in a moment, and to their great pleasure the black fellow, and two or three snails, were soon brought safely to land, besides a variety of other insects.

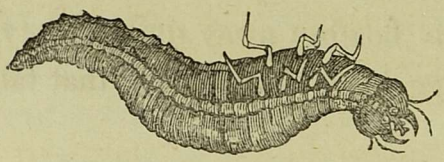
A little dock was quickly formed, and filled with water, and the strange-looking insect, together with the snails, placed in it.

"What enormous jaws the creature has!" said

Charles. "You may well say it is not a leech, Alfred. No leech has a fierce-looking mouth like that."

"Nor six legs, as this insect has," said Alfred.

"See, it is floating on its back like a water-boatman; there, now it has seized one of the small snails; and look, it has turned itself again, and has placed the snail on its own back."



"What *can* it do that for?" exclaimed Charles.

"I suppose he thinks he can smash the snail better in that position," said Alfred, "for he is crushing it between his jaws and his back. The snail is gone so far into the shell that he cannot easily get at it without breaking the shell. How he is sucking it!"

"But how curiously the head of this black fellow must be placed," said Charles, "to enable him to turn it round, and eat the snail from off his own back. If I turn my head ever so much, I can scarcely see a part of my own back; but he twists and turns his head and body in every direction, as if there were no difficulty about the matter. Let us take him home, Alfred, and some of these little flat snail-shells that have stuck to the net."

Alfred agreed; and, by means of a little tin box, and a large-sized phial or two, the boys secured all the insects they wished to take home, leaving such

as they well knew the habits of to enjoy themselves in the pond again.

When they arrived at home, Charles ran to their mother, and begged her to come to them in his own room. "Do come, mamma, for we have something most curious to show you; something that I think you have never seen before. Alfred has gone into my room with it. Can you come now?"

"I will be with you almost directly," replied Mrs. Long. "I am glad you have found something that is new to you."

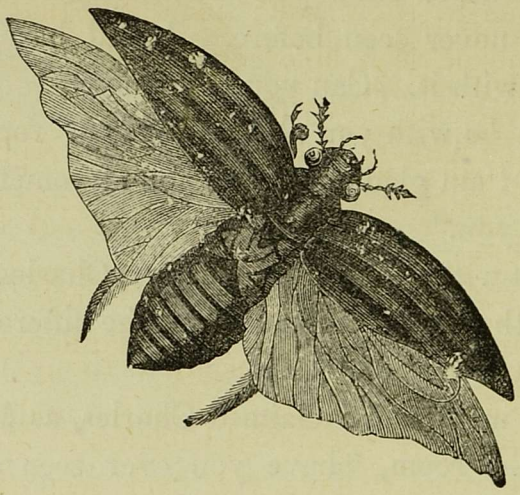
Content with his mother's answer, Charles hastened to his brother, to help him to place the different objects in fresh tumblers of water.

"Now, mamma," exclaimed Charles, as Mrs. Long entered the room, "have you ever seen this pond monster before?"

"Yes," said Mrs. Long; "I have seen them in the ponds three or four times, and once I kept two in a bottle of water for several weeks. I am not surprised at your giving it that name, Charles; for it is a most voracious creature, and preys upon all the other water insects, besides destroying the spawn of fish, and even the fish themselves when in a young state. In France they are called '*Vers assassins*' (assassin worms), on account of their greedy voracious nature."

"But what are they, mamma?" inquired Alfred. "They are not really worms, are they?"

"No; they are the larvæ of the 'great water-beetle,' which is a very interesting creature, and one of the largest of our English insects. The perfect insect measures nearly two inches in length, and, when its wings are extended, four inches across."

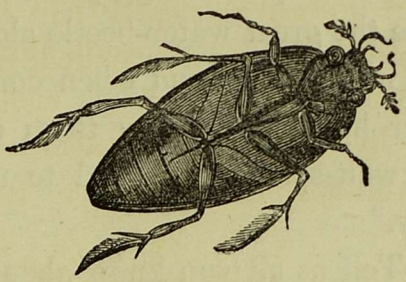


"Have you ever seen the beetle, mamma?" said Charles.

"No, though I have often wished to do so; but I have read about it, and I can show you a print, if you like, both of the larva and the perfect insect. Alfred, fetch 'Shaw's Insects' from the parlour for me."

The book was procured, and Mrs. Long, by turning to the index, quickly found the print she sought for. "*Hydrophilus piceus*" was the Latin name of the insect.

"The extremities of four of the legs are covered with hairs," said Alfred; "just as the legs of the water-boatman are covered, and which you told us, mamma, assisted the water insects in swimming."



"Yes, they do so," replied Mrs. Long; "for the hairs are placed so closely together, that they act like little fins. The great water-beetle swims and flies remarkably well, but it walks badly."

"What can this long pointed thing be," said Charles, "which is represented on the under side of the body?"

"It is a very long and sharp-pointed spine, which seems like a continuation of the hard shelly covering of the throat, and extends more than half the length of the body; but I do not know its use, or whether it can be raised at pleasure."

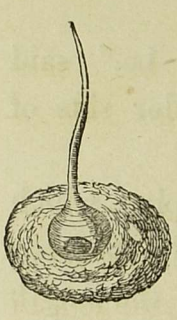
"And this little nest, mamma?" said Alfred. "Is that formed by the great water-beetle for its eggs?"

"Yes; and a very curious nest it is. I wish you could find me a real one. I have long searched for one in vain, though they have frequently been observed by other persons, and even the whole method

of constructing them. The great water-beetle, and a few insects nearly resembling it, are the only insects known to spin an egg-pouch like the spiders. Of these the great water-beetle alone attaches the pouch to a water-plant, and when complete leaves it. The other hydrophili carry them about with them like the wolf-spider, attached to the under side of the body."

"Tell us all you know about this nest, mamma, if you please," said Alfred.

"I have read in Kirby's work on insects," replied Mrs. Long, "that the general appearance of



the nest somewhat resembles a small turnip-radish when reversed, and that it consists of an inner pouch formed of a light down of great whiteness, which immediately surrounds the eggs, and keeps them from injuring one another; and that the exterior tissue is made of a kind of glutinous paste, which, when once dry, becomes a flexible covering, through which the water cannot penetrate. From the centre of the nest rises a little curved horn about an inch long, which is of a silky nature, shining and porous, and which allows the air to enter."

"And how do the larvæ get out?" said Charles; "do they eat their way through?"

"No; they escape by an opening which is left

for that purpose, and which in the print is shown by that dark spot. This part, before the eggs are hatched, is closed by a very thin tissue, which can be easily broken through, though the water cannot enter. Thus the little larvæ are protected from the voracity of fishes and insects, until they quit their curious cradle. The parent insect is furnished with a pair of spinners to form her nest with, something like those of the spider, and she works with great quickness and agility, never leaving it till she has completed her task."

"And how long is she about it?" inquired Alfred.

"M. Miger, a Frenchman, who has observed these insects very accurately, says the general time is about three hours. He has had three great water-beetles at a time all spinning before him."

"And was he ever able to rear the eggs?"

"No; he observed with pleasure the young larvæ quit the nest, enter it again, and sport for some time around it, but he could not succeed in finding out the proper food for them in their tender state. Those that he had taken from the ponds, however, and which were considerably older, he managed to keep until they became perfect insects."

"Indeed! and what did he feed them with, mamma?" asked Charles.

"Small pieces of raw meat."

"And does M. Miger mention, mamma, how

long the insect is growing from the time that the egg is laid till it becomes a perfect beetle?" said Alfred.

"Yes; he thinks it is about ninety-eight days; and of this time the insect passes sixty days in the larva form."

"And how am I to know when my larva is going to change into the pupa, mamma?" said Charles.

"You must sink the tumbler of water in a large pot of earth," said Mrs. Long; "and when the larva is on the point of passing into the pupa state, it will come out of the water, and employ its large jaws and feet to dig a little circular hole in the earth. Into this it will creep; and, covering itself over with earth, will carefully close its cell, leaving no kind of opening. It will remain there about three weeks, gradually casting its skin aside, and acquiring little by little its new form. When every part is perfect in form and hardened, the insect will break open its prison."

"I wish, Alfred, we may be able to keep ours till it changes," said Charles, as his mother finished speaking. "I think we must cover the pot of earth with some gauze or net, or we may chance lose him when he is leaving the water."

"Yes, so we will," replied his brother; "but do not take it away yet. It appears to me, mamma, that this larva breathes through the tail; for if you

observe it well, it frequently rises to the surface of the water, and the tail is always a little raised above the water, and even now that he is swimming head downwards his tail is just on the surface."

"I believe that is the habit of several aquatic insects, Alfred, as well as of this larva," replied Mrs. Long. "I have watched the motions of many that I have not been able to learn the names of, which seemed to be perpetually ascending and descending, tail upwards, to the surface of the water for the purpose of breathing."

"Is the beetle itself as voracious as the larva?" said Charles.

"No, it lives as much upon vegetable as on animal matter, and, therefore, is not such a dreadful enemy to the smaller insects as the larva. There are other beetles similar in outward form to the great water-beetle, except that they are smaller, but whose habits are quite different; therefore, when you search the ponds for the hydrophilus, do not be sure you have found it, until you have well examined it with this print by your side. I can show you books that contain fuller accounts of this larva, but I should like you to keep the larva for a day or two, and to tell me first what peculiarities you may observe yourselves."

"Yes, I should like to do that," said Alfred; "for it is very pleasant, I think, to find out the very same

things that learned people have written about. Has it not struck you, mamma, how oddly this larva floats on his back? And the head is so curiously twisted, that it causes you to mistake the lower for the upper side. Upon first seeing it, indeed," continued Alfred, laughing, "I half thought his legs grew on his back."

"It had been so described by several authors," said Mrs. Long, "until more careful observers gave us more correct information."