

NATURE'S WONDERS:

OR,

GOD'S CARE OVER ALL HIS WORKS.

BY THE

AUTHOR OF "PEEPS AT NATURE."

*The works of the Lord are great, sought out of all them that
have pleasure therein.—PSALM CXL, 2.*

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P R E F A C E .

INTELLIGENT children are often so inquisitive, that an astonishing variety of information may be imparted to them by merely answering their questions. A judicious teacher can easily so guide these as to avoid the evils of desultory conversation; whilst the habit thus formed of observing and generalizing facts, prepares them to deduce instruction from those trivial and unconnected incidents which make up the sum of every-day life.

The record of actual lessons contained in the following pages will, it is hoped, prepare the youthful reader to derive continual enjoyment from the common scenes and objects which surround us.

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NATURE'S WONDERS.



CHAPTER I.

THE RURAL CONCERT; OR, NATURE'S SOUNDS.

A MILD, damp winter had produced much illness; and partly from unfavorable weather, partly from frequent indisposition, Alexander had been nearly a prisoner to the house for *some months*. *Suddenly the air cleared, and*

the late spring seemed to burst forth in unwonted beauty, from very contrast with the past ungenial season. His garden and his grotto were now Alexander's great delight; and he labored diligently to train his growing plants, and repair the mossy retreat, whose ornaments had been sadly displaced by the dripping water.

"Now, dear mamma," said the little boy one bright morning, "the long winter seems really gone. Look how the sun shines, and the ground is quite dry; may we not go into the woods for some striped snail-shells for my grotto? Can you not spare time to put away your work, and walk with me this lovely weather?"

"I will go with you, my boy," replied Mrs. M——, closing her workbox and glancing at the sky. "It will be no lost time to ramble for health now. Doubtless I shall work all the more industriously after exercise, and you will learn better for having your mind refreshed by the open air."

They were soon ready; and Alexander carried a little basket for the snail-shells, or any other stray treasures they might find.

"How beautiful every thing looks, dear mamma!" exclaimed the little boy, as a rustic stile led them into a green cornfield, sloping gently down toward the river; beyond which

rose stately mansions amidst spacious woods, with here and there a gray rock peeping from among them.

"Hark, mamma! let us listen to the silence," remarked the happy child. "Why is it so still?"

"I can hear many sounds, my dear," answered his mamma; "each differing from the other, but blending together into sweet harmony. *There is—*"

"No, do not tell me, dear mamma," interrupted Alexander; "let me try and find out for myself. Ah! you are looking up into the sky; what can you hear there? Is it a little bird singing? But I cannot see it."

"You will see the singer soon; it is a tiny lark. *Indeed, there is a chorus of two or three.* Here they come, dropping down in a straight line; now resting on the wing, now soaring upwards again, and singing all the while, as if their enjoyment knew no bounds."

"There they are, mamma, like black specks. But I wonder how they can bear to look at this bright shining sun."

"They always sing their most cheerful notes in clear, sunshiny weather, as do robins, thrushes, and blackbirds; so that a little observation will enable you to predict the weather, by noticing the tone of their early morning song."

"Really, *mamma!* and is that the reason you so often answer, 'I will hear what the birds say,' when Ann asks you if she shall hang out the wet linen, or take us for a walk? I have often wondered how you knew, for you almost always guess right."

"Well, I only take the voice of the birds as my guide; for in wet and gloomy weather they are very silent, only just now and then uttering a little chirp, or a sort of low, business chatter; as if discussing the building of their nests, or the progress of their young ones."

"How very curious! I remember you told me once before that they sang a different song morning and evening."

"Naturalists can detect a great variety in their notes, my dear boy; and tell us of their cry of alarm, of invitation, of encouragement and congratulation, of anger or distress; all which may be readily distinguished by very ordinary attention."

"I should like to hear these different cries, *mamma.*"

"The common hen furnishes a very good illustration of the sort of difference in the note; from the satisfied chuckle with which she invites her little brood to pick up the worms or seeds she finds for them, to the hurried scream with which she gathers them under her wings when a cat strays past, or

a bird of prey hovers over the coop; while, if a pig ventures to steal a few precious grains from her darlings, the enraged hen is at no loss to express her indignation in language which seems to be well understood."

"And do all birds vary their notes in the same manner?"

"Yes; but in different tones, according to the variety of their usual melody. The rook, for instance, never resembles the nightingale; nor can the peacock imitate the cuckoo."

"It is a pity that the peacock, with its beautiful feathers, should only make such an ugly harsh scream."

"It has been remarked, I believe with considerable truth, that fine plumage and sweet voices are seldom found together."

"You forget the pretty little humming-birds, mamma."

"No, I do not; but that humming sound, whence they derive their name, is caused by the rapid motion of their tiny wings as they flit from flower to flower, in search of honey or insects. But these brilliant creatures are not very famous for their singing powers."

"Do all birds have a song of their own, mamma?"

"A very large proportion of those whose



THE RUBY-THROATED HUMMING-BIRD.

habits are known to us have their own peculiar notes; but many will borrow from each other, and some very different species sing so much like others, that it needs an acute ear and nice perception to detect the variation. The mocking-bird is so clever as to deceive almost all his neighbors in turn."

"I wonder whether the little birds know how to sing at the proper age, or whether they have to learn from their parents."

"It seems to be the male birds which are the chief musicians; and they generally learn from their parents. In the silence of a sick-room, I have often been greatly entertained with listening to the young bird's early lessons; and Miss Graham tells a pretty

tale of a little thrush's complacency in practicing his newly-acquired art, and the delight with which he spent hours in perfecting himself in some sweet cadence or sprightly trill.

"But, mamma, suppose a little bird were brought up in a cage without any papa to teach him; would he sing then?"

"I believe, in such cases, they seldom do more than chirp. 'But if imprisoned before their note is fixed,' says a gentleman who has paid much attention to this subject, 'young birds will copy any songster placed near them, as a finishing governess; and without such education they have a very imperfect song.'"

"Do you think a bird's song could be written down in musical notes?"

"The songs of some birds are easily so arranged, my dear; indeed it is a common opinion, that, as birds were the earliest musicians, men's first notions of music, and the harmony of musical notes, were derived from them."

By this time Mrs. M—— and Alexander had reached the woods, and found their cool glades very grateful; while a cheerful concert was going on overhead among the young leaves, and now and then a deeper note chimed in from the neighboring fields.

"There is uncle Henry's foe, the cornrail.

mamma, screaming away with his tiresome harsh call: surely people did not learn music from him."

"*Not very likely, unless a discord to increase the effect of sweeter sounds,*" replied Mrs. M——, smiling.

"I can hear the soft cooing of the ring-dove, mamma. And there is the cuckoo, too, but he seems to talk rather than sing."

"Yes, it seldom does more than repeat its *own name*; but that is in a very pleasant tone. Magpies and starlings also may be taught to speak; and even the raven has been known to torment some truant school-boys, by repeating the master's usual stern exclamation on finding them out."

"Ah! grandpapa used to tell some droll stories about the tame raven at his school."

"Then, if we include foreign birds, you know there are many talkers, besides all the gay parrot and cockatoo tribe; such as the whip-poor-will, the goat-sucker, and other American birds. Penguins, too, have often startled the shipwrecked mariner into the belief of companions being near, from their chattering and chirping so much resembling human voices at a distance; whilst their short wings and white breasts have still further increased the delusion, by reminding the looker-on at dusk of a group of children in white pinafores."



THE KING PENGUIN.

"I remember poor Goodrich mentions that very thing in his story of his long stay on the desolate South Sea island."

"True; then there is another South American bird called the campanero, or bellman, which greatly enlivens the forests with a note resembling a clear-sounding bell. Indeed, the various songs of birds are more numerous than I can tell you."

"How is it, mamma, that it seems as if

all our singing birds were such *little* creatures? The turkey, and swan, and eagle never sing, do they?"

"No; it has been noticed as a remarkable fact, that the power of singing is confined *entirely to small birds.*"

"What can be the reason for that?"

"It seems one of God's wise arrangements, my dear boy. These little creatures can easily conceal themselves from their enemies; while larger birds would find great difficulty in doing so, were their songs to betray their places of retreat."

"Why do not the hen birds sing, mamma? it would amuse the little ones so nicely before they could fly."

"For a similar reason, Alexander. The hen is the guardian of the nest; and if she sang she might betray it to birds of prey, or the cruel boys who seek her treasures. Now the male bird can sit by and entertain them all, and yet fly away and decoy the enemy in the opposite direction by the melody of his strains; just as you may often notice a little lark hopping lamely before you, uttering *so plaintive a cry that you would fancy he was lamenting a broken leg.*"

"I have noticed that often, and thought I could easily catch the poor thing; but somehow it always was well enough to hop out of my way, and then seemed to get quite

well all on a sudden, and fly away as merrily as possible."

"Ah! all this time his lameness was pretended, just to entice you away from the nest to which you had unwittingly approached nearer than its master approved, and so he did his best to tempt you away."

"Cunning little creature! Can hen birds sing at all, mamma?"

"Yes, they often do when caged, but in softer and feebler tones than the males."

"Hark, mamma!" said Alexander, stopping suddenly in a gloomy dell; "what is that tap, tap? it sounds as if it were in a tree."

"It is either the woodpecker or nuthatch, my dear, seeking insects in the bark of trees; he makes that noise with his hard beak."

"Now you speak of insects, mamma, I can hear the bee and the wasp."

"True! the bees add greatly to the cheerfulness of a spring morning, both in their wild and domesticated state."

"The hives in the garden are very seldom still, mamma, except in the winter, when all the bees are asleep."

"You may distinguish very different sounds in a hive, too, at different times."

"I have never noticed that; have you, mamma?"

"Very often; just before swarming, these little creatures are so noisy that bee-keepers are accustomed to judge of their design by this means. Then on the death of a queen there is great confusion, till a new one has succeeded to the throne."

"If two queens should reign at the same time, what happens then, mamma?"

"Unless one party swarms away, there is civil war till one queen is killed, when all submit to the conqueror."

"That is very curious. Mamma, do you remember what a buzzing there was in that hole on the bank which we saw when we were riding out the other day?"

"Yes, that was a wasp's nest, and some one had provoked its inhabitants; so that, you know, your papa led the horse as far on the other side of the road as possible, to avoid being stung by them, as, when angry, they will attack anybody."

"What tiny creatures bees and wasps are to have a sort of language."

"So well do they understand each other, Alexander, that if the sentinel at the entrance of their nest perceive an enemy, he raises a sound which brings out a large party; who immediately seize upon and kill the intruder, if not too large for their united strength."

"Flies make a buzzing noise too, mamma."

"Many insects buzz with the quick motion of their wings. The gnat, you know, produces a musical sound which is sometimes called blowing his trumpet."

"Very useful his trumpet music is too mamma, to bid us beware of his sharp sting but do not spiders buzz?"

"No, I believe not; the noise you sometimes hear in their webs is the dying lament of some unfortunate fly or gnat."

"I like to hear the cricket's merry chirp; but I hardly ever see one—how is that?"

"Because the house-cricket is wise enough to sit within his hole in your presence; and the field species is so nearly the color of the ground, that it is difficult to distinguish him; moreover, he hops so fast, that it is not easy to trace his movements."

"I have heard of the death-watch; what is that, mamma?"

"The grub of a sort of moth, my dear, which is very clever at nibbling wood; and in so doing it makes a tapping noise with its horny head, which is considered by ignorant people to be a sign of approaching death, because it resembles the rapid tap, tap, of putting in the nails which fasten the lining of a coffin."

"How can people be so silly?"

"It is wonderful, my dear Alexander, how

the human mind can believe the absurdities which superstition invents."

"But we are told in the Bible, mamma, that the serpent spoke to Eve, and that Balaam's ass reproved his master."

"With regard to the serpent, my dear, it would seem that Satan spoke in him; and Balaam's ass evidently spoke by God's power. Both occurrences were plainly miraculous: but the tap of a death-watch is not."

"The cricket chirps in winter-time, does he not, mamma?"

"Yes; it has been beautifully remarked that the insects seem to have made a covenant to sound their Maker's praise all the year round, and the cricket keeps up the winter chorus."

"So do the robins, I think. O! there is a new sound. What animal was that?" exclaimed Alexander, as they pursued their course *over the velvet turf so quietly* that the squirrels and rabbits continued their gambols, all unconscious of strangers, till they were close to their haunts.

"There are plenty of young squirrels leaping about," replied Mrs. M——; "they made the noise you noticed."

"I suppose most four-footed animals make some sort of sound, do they not?"

"Most of them do, certainly. If you

listen a moment you will perceive several joining in this morning's concert; and you can remember many others, I dare say."

"Will you sit down on this fallen tree, *maamma*, and let me count how many animals I can hear now."

Mrs. M—— sat down, and the little boy stood in close attention: a smile of pleasure came on his countenance as he presently remarked, "I can hear a cow and calf, a sheep and lamb, a pig, a dog, a cat, a horse, and a donkey, *maamma*; nine different voices of animals, besides all the birds and insects, and these squirrels overhead."

"I can hear another quadruped's voice still, Alexander."

"Can you, *maamma*?"

"From this little faint squeak now and then, I fancy a cat has caught a field-mouse, and is watching its efforts to escape before she devours it."

"Naughty cat! if she must eat the mouse, why not kill it at once, instead of tormenting it so?"

"Nay, my dear! I can only say such is her instinct; nevertheless, it does seem rather cruel. Take care you do not imitate her when it is needful to destroy any living thing."

"I think the voices of animals are not so pretty as the songs of birds."



FIELD-MOUSE.

"It must be confessed that their cries seem generally intended to express some want, as, when perfectly contented, they appear to enjoy in silence, except monkeys, whose joy is very noisy."

"Pussy purrs when she is happy; but that does not seem like a voice."

"No, it is not; and the lion's roar or the wolf's howl, though useful as warnings to men, are usually the expressions of hunger or rage."

"Then is that the reason why the lions and bears are so quiet just after they have been fed at the Zoological Gardens?"

"Yes; but you know just before their meals they are always very uproarious. However, I have been told that from this you can have but a faint idea of what these animals' voices are when sounding in their native regions."

"Do snakes make any noise, mamma?"

"They hiss when provoked; and the rattlesnake shakes some loose bones at the end of his tail, whence his name is derived."

"And frogs and toads, mamma?"

"They croak to each other. Some small and rather pretty species in the south of France make a sort of chirping noise."

"I know they croak, for I have heard them in the evening; and do you not remember, mamma, how the poor French villagers of old were obliged to stay up all night beating the ponds to keep the frogs quiet, when the baron was at the chateau?"

"Ah, my dear, it is very sad to see how often men oppress their fellow-men when they have opportunity. But we must hasten home now."

The path led by a huge rock, which had been cut through to avoid a steep hill, formerly occasioning many serious accidents to travelers. Several tiny rills were thus divided, which oozed out from the luxuriant growth of tangled wild flowers, bedecking the craggy sides of the road, and dripped with a gentle noise into the little brooks below. Alexander's ear caught the murmur, and he exclaimed, "Hark, mamma! I did not think water-drops could sound so prettily."

"They seem pleasanter here in the bright sunshine than when pattering on our windows in December nights."

"Yes, indeed. O! here is the waterfall, mamma: please stop on the bridge a minute; I always like to hear that."

"The waterfalls among mountain scenery," added Mrs. M——, "give a very lively sound; but think of the deafening roar of the cataract at Niagara, which may be heard thirty miles off."

"That must be almost too loud to be beautiful."

"You heard the sea roaring, too, last summer."

"That was very pleasant when calm; but in a storm, mamma, it was so loud that I did wish it would be quiet a little while, just to rest my ears."

"The poor mariners also doubtless wished it would be quiet, to rest their wearied limbs, and save their ships and lives. But I told you a storm was not useless, though we often think only of its damages."

"I have not forgotten all you said, mamma, about the stormy wind fulfilling God's word."

"Icebergs, too, make a very awful noise, striking against each other."

"Do avalanches make any sound, or do they bury houses and people quite silently?"

"I believe they produce a slight rumbling;

but in mountainous districts this is so frequent from the numerous echoes, that the villagers hardly notice it, and are hence entombed before they become aware of their danger."

"How shocking that seems! But what is an echo, mamma?"

"Sound, you know, is caused by a vibration of the air. When this vibration is checked by a rock, or very high building, it receives a new direction; then, perhaps, it encounters another check, and the sound is thus repeated, or echoed back again, fainter and fainter, as the vibrations become more diffused."

"Is that the reason we sometimes hear the sun-set gun repeated over and over again from different places?"

"Precisely; and the human voice in a favorable situation produces the same effect."

"When I hold your large shell to my ear, mamma, there is a sound like the sea; and it makes me think of the pleasant beach, and all its beautiful rocks and seaweeds."

"Yes, the shape of these shells is well fitted to collect any gentle vibration of the air, repeating it in the pleasing manner you so enjoy."

"Mamma, how the leaves rustle! even that gentle murmur is pretty."

"It sounds very cool and agreeable this warm morning. The young corn, too, adds its note to our country chorus, as the wind waves it to and fro; and, when ripe, it gives a peculiarly rich and mellow sound."

"Really, mamma, I never noticed all these things before; and now I think I shall never walk out without listening for some of them."

"In the stillest winter day, my dear boy, some voice of nature will strike your ear. Even in the gathering storm some persons detect a different sound made by each species of tree as it bends beneath the blast."

"Indeed, mamma! what sort of sounds can they be?"

"One observer remarks, that 'as he approached the forest in a storm, the oak roared, the beech shrieked; the elm sent forth its deep and long-drawn groan; while ever and anon, in a momentary pause, the passion of the ash was heard in moans of thrilling anguish.'"

"Have you ever noticed this, mamma?"

"Very often, my dear: though I cannot say that I have ever arranged their voices so poetically."

"I am sure the wind itself may be called a voice, for it howls just like an animal sometimes."

"It certainly does, Alexander; whistling,

moaning, and roaring: so that people dread the very noise of a hurricane."

"Dear mamma, we must not forget thunder; that seems the grandest of all sounds."

"Ah! the Hebrew poet may well call it 'the voice of the Most High,' as it rolls majestically along, and resounds from cloud to cloud."

"And how awful it is when a peal comes just over our heads, and seems to shake the very house and ground."

"Still I believe the sensations caused by the rumbling of an approaching earthquake are even more imposing."

"I did not know that earthquakes made any noise beforehand."

"Most travelers mention these unearthly sounds; and similar noises are perceived near a volcano before an eruption, when terrified men and animals know not whither to flee for safety; as whichever course they select may be the very pathway of the burning lava, or the exact spot where the earth may open to devour all."

"I am glad we do not live in earthquake countries, mamma; and I am glad God speaks to us in the Bible, instead of the loud, awful thunder."

"It is a blessing, my dear boy, to listen to the still small voice of inspiration in the Holy Scriptures; and in compassion to hu-

man infirmity. God does not speak directly to his creatures, but has 'in these last days spoken by his Son'—'God manifest in the flesh,' the 'one Mediator between God and man, the man Christ Jesus:' so that henceforth all who believe in Christ with the heart may hold free and peaceful communion with God as their Father, through One by whose perfect righteousness they will be saved eternally."

"Thank you, mamma, for all you have told me; I shall always keep my ears open when I go out now. How sad it must be to be deaf, and never hear these things!"

"Many deaf people, my dear, have never heard anything, and so do not regret a pleasure they never knew; but to those who lose the faculty after having once enjoyed it, it is a severe trial."

"Then I should not like to ask any deaf person about his feelings."

"Certainly not. It is generally painful to answer questions about bodily infirmity; but, in Dr Kitto's little book on 'The Lost Senses—Deafness,' you may read a most touching description of his feelings on the subject; while, at the same time, it is an admirable specimen of success in seeking happiness from other sources."

"Well, he will be able to hear the sweet music of heaven, will he not, mamma?"

"I trust so, my love; and perhaps enjoy it still more than those who can appreciate the pleasant harmonies of earth."

CHAPTER II.

APRIL WEATHER; OR, NATURE'S VARIETY.

"March winds and April showers
bring forth May flowers."

Thus sang Alexander, as he scampered in from his garden to seek shelter from a sudden storm.

"There is only a small cloud, so it will soon leave off raining," he continued. "I am glad it pelts down so hard; it will wash the insects off my rose-bushes and currant-trees nicely. O! here is sunshine again; now for a rainbow. I must run to the parlor window to look for it opposite the sun."

At the parlor window he had his wish gratified by the sight of a splendid arch stretching across the heavens. He stood in silent admiration watching its varying tints, as the passing shower rendered it now bright, now faint, and then bright again, ere it faded quite away, and gave place to the clear sunshine which was reflected in sparkling hues from the dripping trees.

"How pretty April weather is, mamma."

remarked the little boy, as Mrs. M—— entered the room. "I like April better than any other month in the year, do not you?"

"Its sudden and rapid changes certainly afford much beauty, my boy," replied Mrs. M——; "but I hardly prefer it to the more settled month of May, or the rich tints and bracing air of October."

"To be sure I should be sorry always to have April weather; for, besides your favorite May and October, mamma, there are the nice long days of June and July, and the harvests of August and September. Even the snow and clear blue sky of winter are pleasant in their turn."

"God has made everything beautiful in its season, my dear; and each hour has its appropriate enjoyments."

"That is very true of the weather, mamma; for a storm out of doors makes our comforts at home more pleasant; but when I have any trouble or sorrow, everything seems dismal to me."

"That is always the case when conscience reproaches us with doing wrong; but if you feel dull in affliction of God's sending, it is perhaps because your eyes are not open to the pleasures which are still within reach; for there is no distress which he cannot mitigate; or he so sustains the sufferer that he counts his affliction 'all joy.'

"The tide of grief can never rise
Above the throne of grace."

"If I must have sorrow, mamma, I hope you will teach me how to find happiness again."

"If your heart rejoices in God as your Father through Jesus Christ, my dear boy, every providential event, and every natural scene, will be full of interest to you."

"Just as I have liked the changes of weather better, ever since you explained how helpful all were to the trees and plants we want for food."

"Exactly; indeed, we seem formed to enjoy *variety* more than if we were confined to the same uniform scene, or one monotonous duty all our lives."

"Ah! yes, mamma; how delightful it is to take a journey, and see new places and fresh people."

"Very delightful, my dear; but as that does not come within everybody's power, suppose we just consider the variety which may be enjoyed without quitting our own neighborhood. The space seen from this window, for instance, is not very extensive, I grant, but all the better in this respect to illustrate my meaning."

"Let me look, mamma. There is our own little garden first."

"Well, how much variety you may see

there, both of animal and vegetable structure."

"I have often noticed the many different shaped buds, mamma; and my book says they almost always open in a different manner."

"Very true; and when fully spread out, how endless and elegant the variety! Even on the same tree, while there is a general resemblance, no two leaves are precisely alike."

"O, mamma, is that really the case?"

"Now the rain has ceased, you can just gather a handful of variegated laurel and ivy leaves to prove the truth of my remark, dear."

Alexander did so, greatly wondering at an assertion he could scarcely believe, and yet sure of his mamma's accuracy. He looked over the trees very carefully, trying to select those which promised the greatest uniformity; and returning to the parlor, spread them all out on the table to find an exact pair; but in vain: neither the marks on the laurel, nor the shapes of the ivy leaves, would bear a minute comparison without displaying considerable variety of ornament.

"It is very strange, mamma, that they should be really so very different; for each leaf looks like its own kind, and no other, and yet, you see, none of them exactly match."

"I have spent many an hour, Alexander, when at your age, seeking to match vine and currant leaves, but never, as I remember, was successful."

"And is it so in everything, dear mamma; the blades of grass, and all the pretty flowers which can be so easily distinguished into their different sorts?"

"I believe, my boy, there are no two beings precisely alike. A handful of wild flowers from any narrow space of hedge, you know, furnishes a great variety both of shape, scent, color, and use."

"They do indeed; and what a pretty nosegay of different kinds of grass you gathered last summer."

"Among plants there are new species continually discovered. But just to mention a few of those most common, look at the difference between the corn-plant and the cactus."

"They are very opposite, mamma; the cornplants so tall and slender, and many of the cactuses like great bristly balls, or long lumpish clubs, looking as if they were stuck together with pins."

"But, Alexander, what beautiful blossoms these same awkward-shaped plants yield! Then, again, remember the aloes and Virginian creeper, how opposite in shape and habit!"

"The bee-orchis and fly-orchis too, dear mamma, how very different to the fern and the peony!"

"They are, my dear; so is that little delicate dodder your aunt Mary sent us, twining round the heather and furze—its tiny roots gatheting sufficient nutriment from the plant which supports it—very different from the sturdy, gnarled oak."

"There are a great many different trees in the forest, mamma."

"Yes, even in our own climate there is a pleasing variety between the tall fir and drooping willow; to say nothing of the palms and banyan tribes of foreign regions."

"And have all these different blossoms and fruits, mamma?"

"Yes; in every green-grocer's shop, you know, there is an ample choice of fruits and vegetables; and in pictures of those in other climates you may see a greater variety than you can imagine without such a help."

"You showed me the pictures of many Indian fruits the other day."

"And the productions of other countries are equally various, my dear. There is also a corresponding variety in the use of plants. Some, you know, furnish man or beast with nutritious food; others with valuable medicines; some with deadly poison; whilst others supply materials for clothing or orna-

ment. Then the various degrees of hardness, durability, or beauty, are appreciated and prized by man."

"Is not all wood alike, then?"

"By no means, either in color or grain: *you yourself can distinguish between plain deal, and mahogany or oak. Zebra wood, maple, walnut, and cherry-tree differ from all the others, too. Moreover, I have heard you make very particular inquiry for the close-grained box-wood, when you have been hunting among the carpenter's chips, for little pieces for your models of houses and towers.*"

"To be sure! I had forgotten that. I cannot carve anything on deal; and elm is too hard for my tools, and oak too crooked for my use."

"Then there are the useful osier and bamboo tribes, different from all others, and yet so valuable for basket-work and household furniture; I know not how we could spare them."

"What a wonderful variety of plants there is, mamma!"

"There is an equal variety among animals; and, *even in the same species, those accustomed to them detect various peculiarities of countenance and form.*"

"Mr. Jowett says that the shepherds in Palestine knew each of their sheep,

mamma, and called any one from among the rest."

"That is the case with most shepherds who really take a kind interest in their fleecy charge. But you can easily see a great difference among them with your own eyes, if you look attentively at any assemblage of animals."

"And if we can see a *little* difference, mamma, I dare say the animals themselves can see a great deal more."

"That is very evident, as the young one always finds its own mother, even in the dark; and when the birds have selected their mates, they never change for that season, unless death intervenes; while bees, wasps, and ants carefully banish intruders, even of their own species."

"What very different shapes animals have, mamma, from the great clumsy elephant to the pretty little humming-bird."

"If you include fishes, reptiles, and insects, Alexander, the variety seems almost interminable."

"Yes indeed. Only think—whales and birds of paradise; giraffes and seals; tortoises and butterflies; monkeys and snakes; parrots and oysters; snails and dragon-flies, beside the walking leaf, the praying mantis, and all those curious insects captain A—— showed us at the Museum the other day.

Dear mamma, I think I shall never get to the end of my list."

"At the Zoological Gardens you may see a very interesting assembly."

"How differently all these creatures like to live too, mamma."

"Their habits of life are well worth study, my dear, even in the partially artificial state you see there: but in their own native haunts still greater variety may be observed; some preferring a gloomy den, others the feathery nest."

"There seems no place where some sort of animal cannot make a comfortable home, mamma."

"Very true; and their habitations present endless diversity of form and material, from the gossamer spider's web to the beaver's elaborate structure."

"The bee's honeycomb too, mamma; that is not a bit like the rook's nest."

"Nor does the spider's silken purse of eggs at all resemble the slimy holes in which worms and frogs choose to nestle, on the banks of our ponds and ditches."

"Mamma, what was that curious white lump on the bough of a tree in grandpapa's cabinet?"

"A South American wasp's nest, my boy. Inside it was filled with cells something like honeycomb. There is also in the same



ARRANGEMENT OF HONEYCOMB UNDER A GLASS CASE.

country the tailor-bird, so named from forming his pendent nest by sewing leaves together as they hang on the trees."

"How very curious it must look to see the little birds' heads peeping from their hanging nests."

"A tropical forest is full of strange beauties; with the gay plumage of birds and butterflies, and the bright gleam of fire-flies as evening closes in, and renders their tiny lamps visible."

"In foreign countries, too, I suppose the people themselves look different."

"Surely; most travelers speak of the very manifest change in form and color, as well as mode of life."

"Ah, some people are black and some white."

"Others are copper-colored, dusky red, or dark olive; and every shade of brunette and sallow complexion is to be met with in wandering over the earth."

"I wonder whether there would be any chance of mistaking human beings for animals."

"O no; man, in his most savage and degraded state, still preserves a portion of that dignity which proclaims him lord over all beasts. But in stature and countenance you may notice striking variety."

"Are not the inhabitants of cold countries usually short and thick, like the Esquimaux?"

"This has been generally observed, and appears to be the sort of bodily frame best suited to the hardships of those rigorous climates; while, in warmer regions, the human form grows taller, perhaps, but more spare, and proportionally less able to bear exertion."

"People are not much alike in any country."

"No; for though nations have certain characteristics of countenance, there exists, amongst the individuals of each nation, a considerable variety of feature and expression."

"We can see that, mamma, if we only just notice particularly the people we meet in one street or one crowd."

"True; there is a marked difference, and yet often it would be difficult to describe wherein it consisted."

"Well, it would be very dull, I think, if every one looked like his neighbors."

"And very inconvenient, too, as there would be some difficulty in distinguishing our own relations. Then in the same person, what interesting changes pass over him as he grows from the little plump, smiling infant into the hoary-headed man; each stage pleasing in turn, and agreeable to the person himself, if properly trained."

"Yes indeed, mamma. I feel now almost *as if I were a new person, when I think of the funny little things which pleased me when I was as young as Edith.*"

"And should you live to be my age, dear, or that of your grandmamma, every new period of life will present new feelings, new duties, and new responsibilities."

"Just as my text says, mamma: 'When I was a child, I spake as a child, I understood as a child, I thought as a child; but when I became a man, I put away childish things.'"

"Exactly, my boy. O, how happy to have a Friend and Guide for all these untried circumstances! Only *once* are we permitted to tread the journey of life; and if mistakes are made, we cannot retrace our steps."

"I never thought of that, mamma. Then it is very important always to find out exactly what is right for us to do."

"Very important too, Alexander, that when we have found an answer to the question, 'Lord, what wilt thou have me to do?' that we fill our post faithfully, lest we should deservedly receive the title of 'slothful servants.' To every unoccupied person God says, 'Why stand ye here all the day idle? Go work in my vineyard.'"

"And can all find something to do for God, mamma, even children?"

"Assuredly, my love; so that, as the Scripture tells us, every joint supplieth that which is lacking, that the Church of Christ may be perfect and entire. There is no excuse for a Christian who does not improve his talents, even if he have but one of small value; and where that one is conscientiously improved, God often intrusts another."

"Dear mamma, pray teach me to improve mine."

"Make the most of your opportunities for learning, my dear; and pray that God may make you useful in his service."

"The rain has left off now, mamma. How the wet gravel glitters in the sunshine! why, even the stones there are of very different colors."

"Now you are noticing stones, Alexander,

you may fetch your basket, if you like, ay, we will go to the quarries for some additional to your grotto."

"Thank you, mamma!" exclaimed the little boy, as he joyfully ran to prepare for his walk.

The neighborhood abounded in varieties of limestone, granite, and slate; and Alexander much enjoyed making a collection of specimens of British rocks, under his mamma's guidance, who ever encouraged his researches for natural curiosities, and gladly helped him in whatever field of inquiry his taste or present circumstances awakened passing interest. He was too young to manifest any very decided preference for one, to the exclusion of other subjects; and Mrs. M— was well satisfied so to answer his questions as to show him how wide a range was before him, in whatever direction his future studies might turn. The little boy followed her leading, delighted with the present pleasure, and eagerly anticipating the period for enlarged capacity and more extensive spheres, when old enough to profit by them. They directed their steps towards a slate quarry

As they mounted a steep hill, he exclaimed, "O mamma! what a beautiful view with the lake before us, and the hills all round, and that pretty little river winding along under the green trees!"

"Yes," replied Mrs. M——; "how much more pleasing than a sandy desert, a bleak plain, or even the wild blue ocean."

"I should soon be tired of any of those prospects if we had nothing else, mamma."

"No doubt you would; so you see how much *variety* adds to the enjoyment of our landscapes, especially with the fine changes of sky, which April weather generally brings."

"I am often amused with watching the sky, mamma; only see now what different-shaped clouds; some so black and heavy, others so white and soft, tinged with pink and red, or glittering like gold on the edges of mountain snow."

"There is a rainbow too, Alexander, as if to prove that the sky is rich in beauties amidst clouds, as well as its clear brilliant blue on a summer's day. Then what a gorgeous sunset we had last night; and in the morning its rising beams are well worth observing."

"We must not forget the pretty moonlight too, mamma, which makes such beautiful nights for us sometimes."

"Nor the sparkling stars, my boy, with their varied hues, proving literally that one star differeth from another in glory."

"O, mamma, what large drops of rain: what shall we do?"

"We will take shelter in the large cavern

which you call 'the stone parlor.' This rocky path will lead us there very quickly. Take my hand, lest you slip."

They soon scrambled down the deep descent, and were safely housed before the heavy shower fell; and as Alexander looked round on the favorite haunt he had not visited during the winter, he remarked—

"See, mamma, how differently the walls are colored. Surely it is altered since we were here last."

"I do not perceive any change, my boy; perhaps you did not notice these variations before."

"No, that I certainly did not: they look very pretty. The walls are red, the floor gray, and the roof green, with pure white veins running all over."

"Yes, this limestone has many pleasing varieties, my dear, as more or less of other substances mingle with it; and a little chalk in addition makes those exquisite milk-white rocks you see there."

"I must take a piece of each of these for my grotto, mamma; and some of this black slate will be a pretty change too, will it not?"

"Very pretty, my dear; but I see there a heap of discarded ballast. We may very likely find some foreign granite there."

"Let us look then, mamma;" and Alex-

ander was delighted to find many specimens strange to him. "See, mamma, black, red, gray, white, and pink granite; and what is this?" he continued, holding up a brilliant American piece, almost covered with flakes of mica.

"That is granite also, my dear; but with so large a proportion of talc, or mica, you can hardly see anything else. Here, too, is a piece of mixture called plum-pudding stone."

"What a capital name! why, I can almost see petrified plums and suet. This piece of American granite looks like one of your minerals, mamma."

"It will ornament your grotto finely. If ever you have the opportunity of traveling, you may observe how the forms of hills and mountains differ according to the substances composing them; chalk downs having a smooth gradual slope, while limestone and granite are much more rugged and abrupt."

"I will try and remember that, mamma."

"They generally have very different soils on their surface, too, from the stiff clay, to loose sand and marl."

"Why, mamma, there seems as much variety under ground as we see above it, I think."

"We have not nearly exhausted our list yet. Do you not remember that splendid

table we saw one day, made of different marbles?"

"I do indeed; there were more than I could count before papa called me away."

"Then you must remember the variety of metals, and their numerous ores."

"Really, mamma, they will add twenty or thirty different-looking things to our collection; and more still if all metals have as many kinds of ore as your copper specimens."

"I believe each metal may be found amidst many more combinations than I possess, my dear boy, as a very slight change in the proportions of metal, and other substances, produces a vastly different effect."

"And their uses, too, are not the same, mamma: gold and iron, for instance."

"Then most of the precious stones, Alexander, are found in mines, being the crystals of various substances."

"What! are those beautiful diamonds and amethysts really dug out of the ground, mamma?"

"Yes; a diamond is crystallized carbon, or that part which burns in coal; while jet is the coal itself, highly polished."

"And pearls, mamma, what are they?"

"Pearls are the product of a species of oyster found in the Persian Gulf, near Cey-

lon; but whether the effect of disease is yet uncertain."

"*Mother-of-pearl, I think I have heard, is the inside part of shells.*"



KIDNEY SHELLS.

"It is. Amongst shells we find a great variety of form and texture, as well as color and ornamental marks. When I was a sickly little girl, my mamma helped me to collect shells; and I was amazed at the number of different kinds I found in one month on the coast of Kent."

"Did you really, mamma? Then I suppose there would be many more sorts, if all those found in other places were put together."

"Indeed, my child, you would be surprised at the immense variety to be seen in

any shell shop; and every voyage in new regions reports unknown specimens, as well as new plants and strange animals."

"I wonder how many different sorts of each there are?"

"In botany there are more than seventy-five thousand plants known already."

"My dear mamma! more than one person could ever find out."

"Certainly; this is the result of many persons' researches. Then in zoology, more than twenty thousand species were enumerated in the time of Linnæus."

"And how many stones and minerals are there, mamma?"

"I do not know, but no doubt a proportionate number; while the fossil remains of animals, now extinct, prove that other varieties existed in by-gone ages."

"Really, mamma, it seems as though our world was a mighty world, after all."

"It is a spacious habitation for us, my child, and teems everywhere with life and animation. It is only when looking upwards, and beholding the innumerable worlds, and groups of worlds around us, that we form some idea of our real insignificance in creation."

"And yet, mamma, the Bible says that 'God breathed into his nostrils the breath of life, and man became a living soul.'"

"True; and the possession of immortality, and capacity for endless bliss, or everlasting woe, confers an importance upon man which does not seem granted to any inferior creature. And here again we see endless diversity."

"How so, mamma; is not every one's soul equally valuable to God?"

"Surely, my dear boy; but though equally valuable, they are endowed with different mental powers."

"Ah! some people are much more highly endowed than others."

"Their tastes also differ greatly: some preferring activity, and others quiet occupation; some enjoy investigating one department of nature, and others seek an opposite sphere."

"So some people are astronomers; others geologists, naturalists, doctors, or authors."

"Just so. Then the wants of civilization create occasion for varied ingenuity; and men become merchants, tradesmen, engineers, sailors, agriculturists, or herdsmen."

"What a dull life it must be to be shut up all day in a counting-house or a factory."

"You would find, my dear, much contentment, if not happiness, in such situations. God, in his abundant love and wisdom, has

so constituted the human mind, that it can take so deep an interest in whatever is its duty, that there is no time to feel dull. The professor seeks with pleasure all the dry details needful to secure accuracy in his lectures; while the physician goes from sick-bed to sick-bed, delighted to mitigate suffering or relieve anxiety."

"Those seem noble duties, mamma."

"In the humblest occupation, my dear, there is pleasure in planning, and watching the success of plans; or applying a remedy when things go wrong."

"Well, I can understand that, mamma; but I think it must be very miserable to have anything to do with wicked people: prisoners, for instance."

"Indeed, my dear Alexander, right-minded Christians in such positions consider themselves as highly privileged to offer the message of mercy to those who so greatly need it. I have known a pious surgeon, of his own free choice, spend years in accompanying convicts to the penal settlements; and a good minister assured me that he was as happy as the day was long shut up within the prison walls, instructing his dejected charge, and watching their gradual reformation."

"It is a good thing, mamma, that God has given people such different tastes; be-

cause it would have been very inconvenient if all liked only the same things."

"So the psalmist seemed to think when he composed the hundred and fourth Psalm, and exclaimed, 'O Lord, how manifold are thy works! in wisdom hast thou made them all.' Not only, too, is there room for these different tastes in the world; but in the kingdom of Christ some are apostles, some teachers, some helps of divers kinds, but all to promote the general good."

CHAPTER III.

GATHERING THE FRAGMENTS; OR, NATURE'S STORES.

SPRING had now fairly set in; the birds were building their nests; the sheep sought a thorny hedge to rid themselves of the cumbersome winter wool, which not only heated them, but harbored various insect tormentors. *Rooks* were repairing their old habitations, and bees seeking materials for their waxen cells; whilst the young foliage and opening flowers made such rapid progress that their daily advance could be easily traced. All nature seemed aroused; and Alexander gladly obeyed Mrs. M——'s

summons, to pay a more distant visit than had been practicable in the short days.

"My dear mamma," he remarked, as they pursued their course through the fields, "what a pity it is all this wool should be wasted on these hedges; I could soon pick up enough to make a bed for Edith's doll, or a pillow for some poor person."

"It would require more purifying, or dressing, as it is called, than you could manage, to fit it for our use: but it is not wasted, I assure you."

"What becomes of it?"

"Try if you can find out. A little observation will enable you to discover one very important end thus secured."

"I wonder what it can be! Surely it is of no use to the plants; for see, here is a piece which quite hinders the young leaves opening properly; I will pull it off. O, how curious! they spread out directly, as if glad to be released. Please, mamma, just help my thoughts into the right way to find out its use."

"Hush, Alexander! wait a moment and watch those little birds," whispered Mrs. M——, softly.

The young inquirer stopped, and saw a pair of sparrows flitting from spray to spray, evidently collecting something, which, as they flew past him, Alexander perceived were little tufts of wool.

"Ho, ho, master sparrow! and what do you want with wool? you have a coat of feathers quite warm enough for this weather."

"The sparrows do not need to rob the sheep for clothing, certainly, my dear boy; but they know a nice warm bed will be very comfortable for their little naked brood when first hatched."

"And do they really come to find beds upon the hedges, mamma?"

"They really do; and not sparrows only, but many other birds seek these scraps of wool to line their nests, or weave in with other materials to increase the warmth; so that in a few weeks' time the hedges will be quite clear of their present fleecy spoils."

"How curious, mamma, that they should know where to look for such a thing."

"God teaches them, my dear; indeed, rooks and crows will sometimes pluck the wool from the sheep's back."

"Will the sheep let them do it?"

"They appear very well satisfied to stand quietly, as if rather pleased to get rid of their warm load."

"But they do not seem to like being sheared, mamma. How farmer P——'s sheep struggled when the men began!"

"They were frightened, and did not like the operation any better than you like hav-



ing your thick hair cut: and yet you are glad to lose your long locks."

"I do not mind having my hair cut now, because I can look forward to the comfort I shall feel afterwards; so perhaps the sheep would not mind being sheared, if we could make them understand why it is done."

"Perhaps so; but they have no reasoning faculties, and can only show their uneasiness under present suffering."

"What other things do birds make their nests with?"

"Of almost all kinds of rubbish. The sparrow, particularly, picks up the oddest assemblage—rags, leaves, hair, thread, silk, wool, straw, grass; in fact, exactly such materials as Mrs. Howitt mentions in her pretty poem, 'The Sparrow's Nest.'

"That, I assure you, my dear, is a very accurate description. When nurse heard you repeat it to little Richard the other day, she remarked how often she had examined the sparrows' nests about her husband's farm, and found them all made of similar scraps."

"Then they pick up anything, I suppose, without taking much pains to seek for any special sort of wool or grass."

"They are not at all particular, and will even use the remnants from old nests."

"Indeed, do they pull them to pieces?"

"I do not imagine they would take this trouble; but one day nurse destroyed an old nest of the last year, and scattered it about under the window, to see if the sparrows would reject what had been used before."

"What did they do?"

"They seemed quite pleased to find their goods so handy, and speedily picked all up, and made a nice new nest; not very elegant, to be sure, but quite as good as their neighbors, who had all fresh materials, and one which suited their taste admirably."

"Funny little birds! But would they not have lived in the old nest, just as it was, if nurse had not pulled it to pieces?"

"Few birds will do so; most preferring to build a new habitation every season."

"Mamma, I must watch these pretty



creatures more; they seem to have so many clever ways."

"I have seen beautiful nests made of long grass and horsehair, coiled round and round."

"Where could the horsehair have come from?"

"Stray hairs may often be found about stables; and many birds visit tan-yards to pick up the loose hairs which may be scattered there. Most animals, too, shed part of their warm coats in the spring; and the

birds' instinct guides them to the right places for it."

"O, mamma!" exclaimed Alexander, as they turned into a new field, "see what a number of busy little birds there are here: what are they doing?"

"Do you not remember a haystack was standing here during the winter? so no doubt there is an ample store of scraps left for the spring nests. Ah! look, they are flying away with their grassy rafters."

"What a stiff straw that old rook has in its beak, mamma; one of the thatch straws."

"Some are taking little twigs also; even the bramble is used by some birds, and the thorns are stuck outwards as a defense."

"Look here, mamma, at all these feathers; a dog or cat has eaten a poor bird, I dare say, and left the feathers on the ground."

"Very likely; and these little feathers will be carefully collected to line new nests: the poultry-yard is regularly visited for these things. Mosses and lichens, too, are favorite materials with the chaffinch."

"I have seen the chaffinch's beautiful nest, with little stars of yellow and gray lichen stuck about, as if for ornament."

"Even mud and clay are not despised, but form the habitations of swallows and martins, while thistle-down and the feathery

wings of dandelion and clematis-seeds are much used for their tender broods."

"Really, mamma! then it seems quite a pity to burn any little rubbish which may be so useful to birds."

"Surely! it seems best to put things that are useless to us in some retired nook where animals may, if they choose, avail themselves of anything they can turn to account. Cobwebs are greatly esteemed by the gold-crested wren, who must be very industrious, as she makes her nest nearly an inch thick with this soft, warm lining, interwoven with delicate branches of moss."

"How many spiders' webs she must destroy!"

"Probably she hunts in root-houses, or on the hedges where frost has killed many of the spinners, and left the close tufts of web you may often observe. The bullfinch uses fine roots for its nest; the field-mouse employs carpenters' shavings, and the hedgehog dead leaves."

"Still a great many leaves decay in autumn, mamma; and they smell so unpleasantly, I never like to go into the woods till there has been some high wind to dry them, and drive away the scent."

"But those very leaves, my dear, become a most useful manure to the trees from which they drop, the process of decay producing

substances which renew the power of the soil, and prepare it to furnish the nutriment required for the fruits of the next year. You know there are various kinds of manure: nearly all, however, consist of matter in a state of putrefaction: thus employing refuse which would otherwise be not only wasted, but pestilential in its influence on the atmosphere."

"What sort of things, mamma?"

"I read this morning, that some of the most fruitful vineyards in France were never manured with anything but cuttings of the vines, cut small and dug well into the ground."

"And did that answer as well as the farm-yard manure, mamma?"

"Much better; and was of less trouble and expense to the owners."

"Then perhaps it would do to cut up leaves, and use them in the same way for my garden."

"Yes, weeds kept in a pit and well moistened, and turned about till fully decayed, have proved very valuable for enriching soil. Seaweed, too, answers admirably in some districts."

"I suppose different things suit different kinds of land, and you told me that all earth was not alike."

"True; some need the addition of decayed

vegetables, others succeed better with animal remains; some with a mixture of both, or a simple combination of earths."

"Then farmers and gardeners have a great deal to study in managing their land, mamma, especially if they have different soils on the same estates."

"Certainly, if they wish to render it profitable: and for this they obtain blood from the butchers' slaughter-houses; refuse from sewers; mud from rivers; bones from rubbish heaps; gypsum from the ground; even decayed fish from the sea-shore."

"It seems very surprising, mamma, that such disagreeable things should help the growth of the nice corn, and sweet fruits we like so much. Blood seems a strange manure. But, mamma, are not a great many fruits and seeds wasted? there seem so many more wild flowers than can possibly be gathered. Only look at these hedges now."

"You forget, my dear boy, what a number of birds and animals feed entirely on the seeds and berries of plants. After a hard winter, you may see every heap of manure covered with birds, seeking out some stray seed which perhaps has been gathered there amidst the rubbish."

"I have seen them pecking, and wondered what for."

"Then the refuse from the butchers, fish-mongers, or poulterers, supplies dogs, cats, and many other animals. I have noticed the body of a drowned horse on the sea-shore gradually consumed, first by large creatures who relished flesh; then birds and insects took their share, till at length nothing was left but the skeleton picked quite clean."

"Dear me! that is very curious."

"Some species of fish are so clever at cleaning skeletons, that naturalists have hung their specimens of birds and animals out of their cabin windows, and in a few days have found the bones cleaned better than they could have managed it for themselves."

"Do fishes ever eat seaweeds, mamma? for there seem plenty for them."

"I believe a large proportion live on seaweed entirely; and many small shell-fish make their nests in it, and derive a considerable portion of nourishment, doubtless, from its substance, as you may perceive it nibbled and pierced in all directions."

"Mamma, I have often wondered whether animals require drink regularly, and where they get water."

"Most domestic animals, such as sheep, horses, and cows, feeding chiefly on dry food, require water, which those who feed them provide when there is no natural spring or

tank at hand; but numbers satisfy their thirst, as well as hunger, by the juicy fruit, or moist worm or snail."

"And those which live on dry seeds, mamma, what do they drink?"

"Here, again, you see how every little dewdrop and raindrop benefits some of God's creatures. You may often observe birds drinking from the water-pipes round our houses, or from the wet leaves in early morning."

"They might get a nice breakfast on a cabbage-leaf."

"Cabbage-leaves are not overlooked. I assure you; for, besides the refreshing beverage, there are some choice slugs and caterpillars to be found within their great folds."

"And do the little birds find them out?"

"Yes, and thus rescue many of our vegetables, which would otherwise be eaten up or spoiled by these slimy creatures."

"I know caterpillars like leaves, because my silkworms eat so many from the mulberry-tree."

"And if birds did not like caterpillars, we should be overrun with them."

"What do insects eat, mamma?"

"Some eat fruit; others, like the bee, dive into flowers for the nectar, or sweet juice, secreted in many species: but a fragment

too small for us to see, often supplies them with an ample meal."

"Then, perhaps, those flies that I saw clustered about the carpet, where baby had been sitting to eat his sponge-cake this morning, found some scraps to eat, though I thought Susan had swept up all the crumbs so very thoroughly."

"You are right; I watched that party of flies very closely, and I saw that they picked up some tiny morsels that were nevertheless magnificent portions for their small appetites: most likely every stray crumb finds some appropriate customer."

"It is very interesting, mamma, to see how well God takes care of every little being."

"And very marvelous, my dear Alexander, to trace how the wants and habits of all creatures are contrived to suit one another, so that there is nothing wasted."

"It seems almost, mamma, as if that text, 'Gather up the fragments that nothing be lost,' were literally true."

"I once read a quaint sermon on that very passage, my dear, pointing out many of the facts I have been telling you, and which led me to observe its truth much more than I ever did before."

"I am sure I shall notice it now, wherever I go."

"God himself teaches us the value he sets upon fragments, by his directions to the Israelites respecting the gleaner."

"Dear mamma, is there anything about the gleaner in the Bible?"

"Surely you cannot have forgotten the beautiful story of Ruth gleaning, my boy? Besides continued allusions to this ancient custom in the precepts of Moses, there are special orders that the corn shall not be too carefully gathered in, nor the vineyard too rigorously inspected, but that some shall be left 'for the poor and the stranger' to share."

"I wonder whether gleaners pick up much?"

"Enough to be a great prize to them. You know our poor neighbors think much of their privileges as gleaners, and often return home with large bundles of ripe corn, and seem renovated both in health and spirits by these toils."

"O, they do indeed; so that I remember last summer I wanted you to let me be a gleaner."

"Even in the air we breathe there is no waste; for a large proportion of that which has become impure by passing through our lungs is immediately imbibed, under the influence of the sun's rays, by the leaves of trees, and becomes an important part of their substance."

"Then is it more healthy to live in the country?"

"Yes, generally, as there is a freer circulation of fresh air. But I have often read that the closeness of the crowded city might be greatly remedied by the introduction of parks and gardens, with plenty of trees. The economy of nature has taught many a lesson to men; and philosophers are beginning to find that several of their difficulties are explained by a reference to God's method of working."

"Indeed, mamma; how can this be?"



"The investigation of the eye led to the invention of lenses; of the ear, to instruments for deaf persons, and suitable forms for buildings to speak in. The shape of the oak trunk suggested the form of the present Eddystone lighthouse; the beaver's dam,

various methods for embanking seas and rivers; while the influence of the strong current itself, during a violent storm, determined the precise angles of the Plymouth breakwater."

"Really, mamma, this is very curious."

"The earliest spinners were caterpillars and spiders; the first paper-maker, the wasp; one of the earliest joiners, the carpenter bee. Tailors and weavers, you know, might learn the rudiments of their craft from birds. The sailor, rower, and steersman could imitate the manoeuvres of the nautilus and finny fish. Indeed, the safety of the diving-bell depends upon the same contrivance displayed in many elegant species of shells, to rise or sink at their inhabitant's pleasure."

"Go on, dear mamma; what else?"

"We may study the termites ants for buildings; or the bees for economy of space, the skill with which they knead minute particles into wax, or the order of their government, and the exactness of their separate duties. The Bible, too, refers us to the ant as a pattern of industry and forethought."

"I never thought of all this before, mamma."

"The observation of the different kinds of food that instinct leads various creatures to choose, has led to many valuable discoveries, both of diet and medicine, for men."

"Everywhere, mamma, there seems something living happily."

"True; there is not a nook where some sort of plant or animal is not to be found flourishing, and abundantly supplied by Him who openeth his hand, and satisfieth the desire of every living thing."

"Except the sandy desert, mamma. There is nothing living there, is there?"

"Many insects find a home there, which perhaps are chiefly supplied by preying on each other, or the animalcule invisible to the naked eye; but here and there are oases, or bright spots of verdure, which afford resting-places for the 'ship of the desert,' as the camel is sometimes termed: and he,



THE PITCHER-PLANT.

you know, is endowed with a singular organ for retaining water, so that he needs not to drink every day; and the insects slake their thirst in the cups of the nepenthis, or pitcher-

plant, which are filled by the heavy dews occasionally falling there."

"Ah! God does indeed make provision for his creatures."

"Yes, and he even stores up material for future use."

"What sort of stores, mamma? I thought all the food was eaten up every year."

"Some animal, and vegetable food too, requires many years to mature. But I was thinking of our useful minerals!"

"I suppose it takes a long time to form them."

"From the experiments and observations of scientific men, it seems that the natural deposits of most minerals occupy periods of many centuries, differing in length of time according to the substances combining."

"How wonderful this is, mamma!"

"Even the convulsions of nature—an earthquake, for instance, burying whole forests—supply one of our most valuable comforts."

"How so, mamma?"

"Coal seems to be the remains of such forests, and, in some mines, exhibits perfect specimens of trees thus decayed."

"And is this a slow process?"

"So slow, my dear boy, that most of the exact species of plants found in coal are now extinct: the tree-fern especially seems to be

the most plentiful, and is not now to be found in its natural state. Geologists give some interesting drawings of its appearance.

"Then the lava from volcanoes, when hardened, becomes a useful stone. Pumicestone is one of their contributions to our use. Thus in nature's vast storehouse we find all that is needed for our welfare; while her Great Master has ordained that none of her fragments should be lost."

CHAPTER IV.

THE PEACOCK'S FEATHER; OR, NATURE'S ELEGANCE.

"SQUIRE KING," as his rustic neighbors called him, resided in a modest mansion near a picturesque country town. His grounds, though not extensive, were tastefully disposed, and presented an agreeable variety of hill and dale, wood and water. He kept *many curious animals; and the favorites of the aviary or the park were stuffed, when dead, and carefully preserved, till the library looked more like a museum than a retreat for literature.* Though childless themselves, the squire and his lady were both fond of

young people; and a day spent at the hall generally afforded subjects of pleasing instruction, or endless research upon the works of creation.

Alexander returned home one fine evening



highly delighted with a present of the peacock's train, which, in accordance with an ancient custom, had decorated the dish in which the roasted bird was served at dinner.

"Only look, dear mamma!" he exclaimed, displaying his treasure; "how perfect all the feathers are! Mrs. King said they seldom had one in such good condition as this."

"Then I am sure it was very kind in her to bestow it upon you. The colors are remarkably rich and bright."

"And how regularly the spots are put, mamma; do they come after the feathers are all grown?"

"No, my dear; each feather is fully colored as it grows: there is but one spot, *or eye, as it is sometimes called, in each.*"

"Ah! I see that it is so, mamma. But how curious that when all are spread out they should form such an exact pattern! See, none of them are out of place, even among so many. I will count them, if I can: one, two, three—I do believe there are a hundred."

"That is not an uncommon number, my dear; but just examine a single shaft, and you will better understand its wondrous contrivance."

"What a length it is, mamma! I will measure with your ivory foot rule. O! just see, the longest in the tail are three feet, a whole yard."

"These long feathers, my dear, are not the peacock's tail; that is hidden underneath: we must call it by its proper name of train."

"These outer rows of the fan, mamma, have much longer bare quills than the inner rounds, which lap over the others."

"True; as I have often pointed out to you, there is no waste in the works of God, though abundant provision is made for comfort and utility: so great a mass of feathery fibre would overheat and greatly inconvenience the bird, while adding nothing to its beauty."

"Each fibre seems a perfect little feather, mamma, and is very beautifully colored."

"And each bears such a portion of color as to produce, when all together, the most regular and becoming groundwork, as it were, to display the exquisite spots which adorn the magnificent outspread fan."

"When I look at these spots quite closely, mamma, I see there is only half on each side of the feather-stalk, and yet they match exactly."

"Moreover, Alexander, each tiny fibre is placed with the right side uppermost, as well as in its right place of the pattern."

"I never thought of that: yes, the back of the feather looks very different."

"How neatly they are arranged, too, slanting gradually upwards, more and more, till the upper ones spread straight out, having each edge more fully colored, and so shaped as to produce a most graceful curve for the termination of the feathered shaft."

"One, two, three—ten different colored rings, dear mamma, in each spot, all shading into one another so softly and beautifully. I wonder how the colors got there?"

"That question has excited the wonder of many learned men who have examined them. They begin, like every other feather, as little bladders full of fluid; and as the bird grows, the proper material is secreted, which gradually extends into the horny quill and the delicate fibres, each divided and subdivided in a marvelous manner, so as to wave with the slightest breath of wind, yet firmly fastened together, and nourished into their mature beauty as the animal attains its full size."

"It is wonderful indeed, mamma; it cannot be by *chance*."

"Just to prove to you, my dear boy, how impossible it is that such regularity could be produced by chance, I will cut off the fibres of my old peacock's feather close to the quill, and you may try to arrange the spot again: here is a sheet of white paper to lay it on. Shall I jumble all the fibres together?"

"Yes, if you please, mamma; that will be a nice puzzle to put right: I will take my nice new train to look at."

"Do so; I am going to put some parcels away in the store-room, so you will have half



FEATHER'S FEATHER.

an hour to yourself, and can perhaps manage better undisturbed."

Alexander began his task with great zeal, feeling pretty sure of speedy success; first of all arranging the fibres in pairs for the corresponding sides of the star, and then putting them together. He found it, however, a very difficult task; and had only just commenced with the parts containing the purple outline when his mamma returned.

"Why, mamma," he asked, "is it half an hour yet? I have only just begun making my star."

"I have been detained for a whole hour, Alexander; but concluded you had not finished, or I should have heard the news, no doubt."

"Yes, I thought I should soon have to tell you it was done; but I am glad I tried, because I feel now how much skill there is in making a feather with a pattern on it. Are there never any mistakes, mamma?"

"Never, my dear. Job speaks of the 'goodly wings of the peacock;' and, from the earliest notices of these birds, the same style of plumage has been recorded as distinguishing each species."

"I suppose, too, if every peacock were as fine as Mrs. King's, there must have been many millions of feathers made."

"It is impossible to calculate the numbers, my boy; for every year the peacock sheds his train, and a new one follows."

"My dear mamma! I am surprised that all this beauty and wonderful contrivance is only meant to last a year. Do all birds shed their feathers as often?"

"I believe so; some species even more frequently."

"What time in the year are they changed?"

"At various seasons; but chiefly in the spring or autumn, and sometimes both: this change is termed molting."

"Now I remember seeing grandmamma's canary bird looking very dull and shabby one day, and she said it was molting; but I did not know what she meant."

"Most birds seem to hide themselves during this change; the peacock especially appears very unwilling to exhibit himself when his train is incomplete."

"I wonder whether the feathers get old and worn out before they are dropped."

"Those who have watched this process attentively, and examined the dropped feathers, remark that they are invariably imperfect: either dim in color, or shattered and torn."

"How is that, mamma?"

"It appears that they derive some sort of nourishment from the bird, which preserves their beauty while adhering to its skin; but when this supply is stopped, by the formation of new feathers pushing the old ones out of their places, these decay, something like your teeth when the second set arrived."

"Then that accounts for my peacock's feather being so much brighter and more perfect than yours was, mamma."

"Just so: my old one was picked up in the poultry-yard, when discarded by its former owner; and yours, Mrs. King told you, came from the bird which had been killed for dinner, when in full health and vigor."

"I forgot to tell you that the peacock's head was on the other end of the dish. O mamma! it had such a beautiful crest. It was stuffed; so Mrs. King said she could not spare that, but she let me look at it."

"Did you notice what sort of feathers it was composed of?"

"Yes; there were twenty-four all sticking straight up with white stalks, and the

feathery tufts green, and shining as if they had been dipped in gold."

"They were formed differently from the train feathers, then."

"Very differently, mamma—more like tiny brushes, which surprised me; for I thought, before, that all feathers were made alike, though not all the same colors."

"No, my boy, there is great diversity in their construction, to suit the various necessities of their wearers; though there is certainly some general resemblance."

"First, then, please tell me how they are all alike, mamma."



QUILL FEATHER IN PROCESS OF DEVELOPMENT.

* "They all grow from a shaft, or quill; and this quill is not the least wonderful part of a feather."

"Indeed, mamma; I see nothing very strange or curious about quills."

"I dare say papa will spare us a new quill from his study, if you run and ask him, and then we can examine it."

Alexander went, and soon returned with

specimens of goose and crow quills, as well as a little box of parrots' and macaws' gay plumage.

"Here, mamma; papa said perhaps these pretty feathers from London might help you. But what is there wonderful in these plain-looking goose-quills?"

"Look at the stem or barrel; what do you think it is made of, flesh or bone?"

"It does not seem exactly like either, mamma; but more of a horny substance."

"Yet it is not horn, but a material made for nothing else; and consisting of fibres extending lengthwise, and carefully bound round with rings at regular intervals to preserve its lightness and elasticity, while adding to its strength."

"I never knew that before, mamma."

"Unless we scrape off these, the quill will not split evenly into its long fibres, when we divide it for making a pen: see how jagged the edges of this quill are, which I have tried to split with its rings on."

"It is indeed; and now you scrape another it looks quite even. But what is that dried stuff you pulled out?"

"That is the remains of the pith which formerly nourished the feather, and is quite a unique substance, to be found in no part of any other class of animals."

"And have all these tiny feathers in papa's box such curious quills, mamma?"

"Yes; even the little humming-bird's plumage is as complicated as the eagle's."

"The feather part of the goose-quill is much closer than the peacock's train feather."

"Because the quills we use for pens are procured from the wings of the bird, and the vanes of the feather are therefore especially adapted for flying; each barb, or ray, is contrived to hook into the next by a vast number of minute fibrous teeth."

"Dear mamma, I cannot see them."

"No, they are too small to be distinguished without a microscope; but one thousand of these have been counted in an inch."

"How very wonderful, mamma!"

"Those, too, which bend downwards are branched and tufted; whilst the opposite ones slant upwards, without branches, and shut into them, as you fasten your fingers when clasping your hands very firmly."

"How very small they must be! It is no wonder we cannot see them without a microscope. But why do these little threads hook together?"

"In order to make a stronger sail, as it were. If you look attentively, you can perceive that the fibres of the pen are not fixed like those of the peacock's feather."

"I see, mamma," replied Alexander, examining them; "the peacock's feather has the flat side of the thread towards us, but the pen threads are fixed with the flat part sidewise."

"Just so. Moreover, these hooks are placed on each side of the quill filament, and the filaments themselves are much closer together; so that it forms almost a solid sail, or at least a well-woven one, to support the bird in the air."



"Then I suppose, mamma, the poor little birds can never fly till their curious wing-quills are grown."

"Certainly not; and it is worthy of remark, that in every species of bird, that part of the plumage appears first which is most wanted: so that the little nestlings that are confined to trees, till they can fly, have their quills developed earliest; while partridges, chickens, and ducks are clothed, when very young, with a soft down to keep them warm while running about."

"I have noticed that, mamma. When the bricklayer was mending the roof of our house he turned out some sparrows' nests, with the young birds; and I wondered why their wings seemed coming before their poor little *naked bodies were covered, while our young chickens and ducks had a warm coat of hair all over them long before a single feather peeped out.*"

"These close wing-feathers of birds offer so much resistance to the air, that you may hear a considerable noise as they flap their wings or fly past near you."

"Yes; I can always hear the martins fly in and out of their nests round the summer-house."

"No doubt; but this noise would be very inconvenient to the owl, who seeks in the silence of night for the timid field-mice, which would get out of the way were they thus warned of the approach of their enemy. The wing-quills of this bird, therefore, are varied, so as to enable it to fly without producing any sound."

"That is curious: how is it managed?"

"Chiefly by breaking the edge of the feather. See! here is one in papa's collection; it is toothed just like a comb."

"Could not birds fly so well if their wing-feathers were as loose as those of the peacock's train?"

"Surely not. As a proof of this, the ostrich cannot fly on account of the separation of the filaments composing his wing-feathers."

"If those pretty ostrich plumes are of no use to the birds themselves, mamma, ladies may as well have them for ornaments."

"They aid their speed in running. The emu and cassowary feathers too, beautiful and curious as they are, are equally useless for flight, though affording dress very well suited to the habits of those birds. The very short fin-like wings of penguins also aid them in swimming, but not in flying."

"I have seen emus and cassowaries, but I thought they were covered with a sort of hair."

"No, they are very fine slender feathers, but with such long barbs to each filament, that at a distance they do resemble silky hair. They are remarkable, also, for having two, and sometimes three, perfect shafts, growing from one quill."

"Indeed, mamma; is not that very strange?"

"Not so uncommon as you may suppose. Many parrots and macaws, as well as other birds, have a tendency to this double feather; but you seldom find both arriving at equal perfection; usually one is very small, scarcely more than a downy appendage."



"What is down, mamma? I heard a gentleman telling papa such an interesting story, of some one who narrowly escaped being killed while he was getting eider-down."

"Nurse has brought me Edith's swans'-down tippet to mend a hole she has torn in it, so you may examine it."

Alexander turned it about, and tried to separate a single tuft; he then remarked, "It seems, mamma, like clusters of very tiny feathery threads without quills."

"That is a tolerably correct description, my dear boy."

"But what is it fixed on, mamma—a sort of skin?"

"That is the actual skin of the swan, Alexander; there is no artificial way of fixing these feathery clusters so good as the natural mode."

"Do all birds have down, mamma, under their feathers?"

"No, my dear, it is peculiar to water-fowl, and seems intended to preserve the necessary heat of their bodies while swimming and diving for food."

"Then why did the men Mr. J—— was speaking of climb to the eider-duck's nest for the down the birds had on their bodies? It would have been easier to shoot them as they swam."

"The collector knew that this down is always most plentiful when they are building nests, and that they pluck the best of it from their breasts to make a warm bed for their little ones: and ingenious man has discovered that it also forms the softest bed, and the warmest coverings for himself in cold weather; and a high price is therefore given for it."

"Poor birds! how many nests must be robbed to make one of our beds! Is it always so white and pretty as Edith's tippet, mamma?"

"No; it has been observed that all the small water-birds which spend the winter with us have a coat of black down close to the skin, whatever may be the color of their outer feathers."

"Why black, mamma?"

"Probably because that color is best

adapted to prevent heat escaping, and thus affords the protection they need against our cold climate."

"There is a poor robin come to look for his crumbs. Do you know, I think all our robins have grown thinner since the warm weather came, and yet there are more worms to eat; is not that odd?"

"The fact is, that in the winter they spread out all their feathers loosely, so as to prevent the cold air coming so near to their bodies, as they enjoy having it in the spring and summer time."

"Just as the long hairs of our coats keep the wind from our throats, mamma."

"Exactly; and the soft downy plumage of owls answers the same purpose."

"Ah! I stroked my cousin's tame owl on the breast, and I thought I never felt anything so soft."

"Their loose texture is admirably adapted for the warm clothing they need while roaming after their prey during the night. Those who sleep in warm nests, or are only summer visitants, do not require such ample robes."

"But do not the dew and fog make them very uncomfortable?"

"Feathers seem particularly formed to resist water. You may notice how the rain rolls off the chickens' backs when they are

exposed to it; but they seldom choose to stay out in a shower, running for shelter as quickly as possible."

"The pigeons keep at home in wet weather; and I have often heard you say, 'Rain is coming, all the birds are flying home so fast.'"

"Very true."

"But the ducks and swans, mamma, seem to swim about very unconcernedly, and like paddling about in the water."



THE DUCK.

"They possess glands, secreting an oily fluid which shields their skin from water, and with which they can at pleasure anoint and dress their feathers."

"They seem very particular to lay all their feathers straight and proper; and clean off every splash of mud."

"This is a very important matter, as they are placed to overlap one another so closely, that when all straight and proper, as you

say, it is scarcely possible for the water to penetrate; but if in disorder, you know, the consequences would be different."

"Then I will not accuse the poor ducks of wasting their time in vanity any more."

"All birds seem impelled by instinct to keep their feathers in very neat order—dressing them, and laying them exactly smooth and fit for use; while this attention certainly adds to their beauty."

"I do not remember ever seeing a dirty, untidy bird, mamma, except one that was ill."

"Were it not for their neatness, their feathers would in all probability become torn or injured, so as materially to hinder their usefulness."

"I think that beautiful stuffed golden pheasant Mrs. King showed me, must have had enough to do in keeping his feathers neat, when he was alive. O, it had such multitudes of long feathers in each wing, mamma, beside his tail and his crest! Do you think they could have grown quickly enough to be all perfect in one year, after he came from the egg?"

"Many birds, my boy, do not get this mature plumage—that is, their grown-up dress—for two, three, or even more years; but acquire it gradually at every molting, having a larger new growth, fit for an older bird."



THE GOLDEN PHEASANT.

"Of what use are those long tails?"

"They serve as rudders to direct the bird's flight: hence short-tailed birds usually have long legs, which they stretch out behind them to answer that purpose; while the long-tailed birds gather their short legs close to their bodies."

"Then do you think, mamma, that every feather is intended to be of some use?"

"Perhaps not; it seems as if God has been pleased to bestow a vast quantity of mere ornament upon birds: the trains of the lyre-bird, peacock, and bird of paradise, for instance."

"It may only be, mamma, that we do not very easily see a use for them."

"The variety of crests, too, which adorn *their heads, cannot fail to strike every visitor to any collection of birds.*"

"Even looking through a number of pictures, I see a great many: and there were more among Mr. King's stuffed birds; some sticking straight up like a brush, others spread like a crown or fan, others lying back."

"Many foreign birds have crests so delicately formed, that the broad, colored blades at the end of a thin, quivery shaft look almost like pendent emeralds, when a sun-beam glistens on them."

"Mrs. King had a beautiful bunch of curious feathers in her bonnet, mamma: they were round white ones; and so light, they looked almost like dandelion puffs, only not the same shape. I did not like to ask her where they came from; but you saw them when she called the other morning."

"You mean those called mariboo feathers: they are taken from underneath the adjutant-bird's wing, and seem intended to promote his warmth."

"Well, mamma, I think a bird's dress is almost *more wonderful than all the other things you have told me about.*"

"A learned man asks, 'What would a philosopher do, if a plucked partridge were set before him, and he was required to invent

the most suitable covering for it, combining lightness, warmth, protection from the elements, and all that feathers include; supposing, too, that he had never seen or heard of birds before?"

"Poor man! he would be sorely puzzled; and I should think would give up his task in despair."

"Indeed I think he would; and yet such a supposition makes us marvel at the skill and benevolence displayed by the Great Creator."

"I wonder what the angels' wings are, mamma? I read yesterday, that in some Roman Catholic Church there was a feather from the angel Gabriel's."

"My dear boy, that was only a popish lie. We have no reason to suppose that the angels have such materials. The expressions *wings* and *flying*, as applied to them, seem to be figurative, and intended rather to imply the ease and speed of their passage, wherever God bids them. It is a pleasing thought, which the Scriptures seem to warrant, that God's people, in the kingdom of glory, will, in some respects, be 'as the angels,' and even 'equal unto the angels.' It is of the children of God, being the children of the resurrection, that such things are said; and these are penitent believers in Christ, who, through faith in him, are wash-

ed and sanctified by the Saviour's atoning blood."

"O mamma! I should like, as my hymn says—

"As with a seraph's voice to sing,
To fly as on a cherub's wing;
Performing with unwearied haste,
A precept Saviour's best commands!"

CHAPTER V.

YEARLY TRAVELERS; OR, MIGRATION.

"MAMMA," said Alexander, "why is the cuckoo so silent? I have not heard his cheerful voice for two or three weeks."

"It is now the middle of July, my son; so, in all probability, he is gone by this time."

"Gone! where, mamma? Does he not live in the woods near our house?"

"He only lives there for a very short period in the early spring, my boy. About this season he usually quits our country for the year."

"And where does he go when he leaves us?"

"I believe he spends most of his time in Africa."

"What a long way off! How does he get there, mamma? Surely he cannot fly all that distance?"

"Birds generally travel by flight, but no doubt the cuckoo rests on his journey."

"But there is nothing to rest upon in crossing the sea."

"These birds are observed to visit the island of Malta twice every year."

"Is that to rest themselves?"



CUCKOOS

"It is supposed so, as they seldom remain more than a day or two; and in the early spring are seen to arrive from the south, and depart in a northerly direction: whilst on a second visit, in the summer time, their course is exactly reversed."

"Then the little African boys and girls know when to look for them, I suppose. But how do cuckoos know they can rest at Malta?"

"Their unerring instinct guides them. I have noticed birds in the autumn continually taking flight from Dover, where, you know, is the narrowest part of the English Channel."

"Indeed, mamma! They do any other birds leave England besides cuckoos?"

"A very large proportion of the birds known to naturalists, migrate every year from one country to another; such as storks and swallows, woodcocks and martins."

"I wonder why they should take that trouble?"

"For various reasons: some in search of proper food; others to secure the welfare of their young ones; many for the climate best adapted to their clothing and habits. Probably, also, numbers are directed to alight where they will be most useful to man, by *Him who openeth his hand to feed every living creature.*"

"Just as God sent the quails to the Israelites' camp, when they so longed for meat."

"Exactly; though that was in just displeasure, and soon proved a punishment to the discontented wanderers."

"Do the birds that go abroad always keep to the same seasons for their journeys, mamma?"

"There is so little variation, that you will

find most country people reckoning time from the appearance, or disappearance, of certain birds in their neighborhood."

"Then I suppose that is what Mr. C—— meant one day, when he said, 'It is so mild now that we shall soon see the swallows and martins.'"

"Yes, they are amongst our earliest spring visitors; and so punctual that they generally reach any one locality within a day or two of the same month, year after year."

"Nightingales and linnets, mamma, do they come in spring, too? for we have our merriest songs then, I think."

"Most of our little singing birds are migratory; but all are most cheerful and musical when building their nests and attending to the young ones."

"Do all the birds that come in spring spend the summer with us, mamma?"

"A few remain during all the warm weather; but some arrive, and others depart, throughout the year."

"I should like to watch which birds come, and which go. Do any birds come in January?"

"Yes; several from Sweden, Norway, and other cold regions. The redwing, field-fare, and starling arrive; while the snow-flake, grosbeak, and others, depart to the countries the former have left."

“ Ah, to cheer the dull winters and furnish dinner for the poor frozen sailors, I suppose.”

“ During February and March a few others change guard; but April and May are the grand months for the arrival of feathered visitors: and very amusing it is to watch their proceedings.”

“ Do they generally fly in great companies, or so few at a time that people scarcely notice them?”

“ Their habits are very various in this respect. Some fly in enormous wide-spread flocks; others in long narrow columns. Some have two or three leaders, and congregate behind them in a wedge-shaped mass. In a few instances the males and females travel separately.”

“ That is very curious, mamma. Whereabouts do they land in England?”

“ It quite depends upon the region they come from. The northern birds usually content themselves with that part of our island nearest to their own country, and those from the south resort to the more southerly counties of England. The nightingale, for example, is never heard north of Shrewsbury in the west, or of Doncaster in the east; and it is scarcely ever met with in Cornwall and Devonshire.”

“ How is that, mamma, if nightingales like

warmth? I thought Cornwall and Devonshire were such very mild counties."

"True, it cannot be on that account; but most probably they cross the English Channel where it is much narrower, and do not wander so far westward; coming here for the purpose of building their nests and rearing young birds, instead of admiring the scenery."

"Would not that same reason keep a great many birds from that part of England?"

"Certainly; and the comparative silence of the beautiful woods there strikes every one who has been accustomed to the cheerful songs of Hertfordshire, Essex, and Surrey."

"That is a pity, for I have always heard so much of Devonshire scenery; and I think the birds' singing always makes pretty places pleasanter."

"So do I, my dear: and when spending a year there I wondered how it was I heard and saw so few birds, till I read the reason; and then I admired the wondrous instinct which had kept them in localities better suited to their migratory habits."

"Are different birds, then, generally found in different places?"

"To a certain extent that is the case. Thus swimming and wading birds, even if they migrate, invariably select lodgings near water. Of these, some prefer the sea-shore, building their nests in holes of the rocks; as

the eider-duck and the cormorant. Others choose muddy coasts or shallow rivers, where they can wade about; like the cormorant and stork. Others again, like wild ducks and widgeons, enjoy the standing water of fens and marshes."

"And can these birds, mamma, manage such long regular flights in all weathers?"

"No, my dear. It is believed that contrary winds, or heavy storms, often delay their arrival at their accustomed haunts; while death by fatigue, want, or birds of prey, in all probability has much to do in reducing their numbers: sometimes very perceptibly."

"Poor little birds! what a long way those that come from Norway, or Sweden, must fly without a rest."

"Many of them must fly at least fifty miles across the sea, even supposing they rested on the Orkney or Shetland Isles. Swallows have been observed occasionally resting on ships at sea."

"No wonder they were tired, mamma."

"Sportsmen have noticed that sometimes the woodcocks hardly seem to care for either dog or gun, but drop down before the former as though quite overcome with sleep and fatigue, especially in foggy weather; as it is remarkable that these birds always travel by moonlight, and appear to prefer a mist."



THE STRAIT.

"Perhaps that was soon after they had arrived, and were wearied out with the journey."

"It is very probable, particularly as birds seem very sparing of any extra distance. A naturalist residing at Gibraltar, in watching the various species of swallows crossing and recrossing the straits there every year,

remarks that at the shore they usually separate into little companies of six or eight, and skim low down, just upon the surface of the water to the nearest point of the opposite coast, generally landing at Tangier, where is quite the narrowest space."

"Wonderful birds, mamma!"

"Rather, my dear boy, admire the infinite wisdom of the Creator, who endows them with such wondrous instinct; for you cannot imagine that such geographical accuracy is the result of knowledge or reason."

"No, surely, mamma; but if birds are so taught by God, they can have a thorough change of climate from the pole to the equator."

"True; indeed, they may have a considerable range eastward, if disposed to vary their wanderings, or if driven from their customary haunts by any change in the face of the country."

"I do not quite understand how changes on the ground should guide their movements."

"It has been frequently observed, that cultivating waste lands has induced quite a different set of feathered visitors; probably for the different insect or vegetable food thus furnished: so the scene of war or pestilence will bring birds not usual in time of health and peace. An old writer, named Belon, gives a curious account of the incredible

armies of hawks and kites which he saw crossing the Thracian Bosphorus from Asia into Europe, with whole troops of eagles and vultures."

"I wonder what that was for?"

"As they are all birds delighting in decayed animal food, they were probably attracted by some uncommon mortality among men or animals at that time."

"Have you any idea how fast birds fly in their migrations?"

"Some have been known to fly at the rate of a hundred miles an hour. The eider-duck travels ninety, and the hawk one hundred and fifty miles in this time. Other birds are more or less swift, according to circumstances."

"How very fast, mamma!"

"Their general speeds vary in proportion to the length of the wing and the weight of the bird. Thus the swallow flies very rapidly, while the stork and wild-duck are much slower travelers."

"Is the stork a bird of passage, mamma?"

"Yes; even the prophet remarked her regular flight centuries ago. But the carrier-pigeon is, perhaps, the most rapid in flight; and so accurate in its movements, that when hoodwinked, and conveyed eighty or a hundred miles off, it will find its way back in a very short time."

"How soon do you think, mamma?"

"Both in European and Asiatic Turkey it is constantly employed as a messenger, and has been known to traverse the distance between Aleppo and Babylon, thirty days' journey for a man, in forty-eight hours."

"How amazingly quick, mamma! and yet our pigeons at home do not seem to fly very fast, or very far either."

"It is a remarkable fact, my dear, that most of these migratory birds, when settled into their places of sojourn, flit about very softly, or confine themselves to comparatively limited space."

"That is singular; one would almost think they needed a little practice before setting out on such long journeys."

"The birds appear to think so too; for they generally congregate in some open field, or on high ground, for five or six weeks previous to their final departure—making various evolutions in the air, and chattering as though in high debate upon their state affairs. Last September, you know, I pointed out to you multitudes of linnets and swallows so engaged."

"Yes; but I did not understand what you said about migration so well as I do now."

"Some species of fish also migrate."

"Indeed, mamma! they swim, I suppose."

"You have heard of the herring shoals, I dare say, which annually visit our coasts."

"O yes; and I have often wondered where they came from in such numbers."

"It seems they collect together in the middle of the Atlantic Ocean, and form an immense column, five or six miles long, and one or two miles broad."

"Why, mamma, they must make the sea look quite a different color."

"They can be distinctly traced, not only by that, but by the numerous birds which hover over and accompany them, to catch any which may venture near enough to the surface to furnish a meal. They also occasion a rippling sound in the water as they steadily go forward."

"How curious! Go on, please, mamma."

"They swim on thus till interrupted by the Orkney Islands, where they divide into two columns: one taking a south-westerly direction, and visiting Cornwall and Devon, and proceeding down the English Channel; the other taking a northerly course, and coasting the Scottish ports and eastern shores of England. Yarmouth, in Norfolk, is famous for them."

"But what do they come for, mamma?"

"Their motive is to deposit their spawn or eggs; but the poor people of the land view their arrival as a special boon of food from

the great Creator; and eagerly watch for and catch the precious spoil, which, either eaten fresh or preserved, affords them subsistence for the greater part of the year, besides furnishing a profitable article for sale."

"Well, that is very interesting; and surely God does send them."

"Certainly; as the psalmist remarks, 'That thou givest them they gather.' When the herrings have passed our coasts, the survivors reach Holland, and are welcomed there with unbounded joy as a providential gift."

"Do any other fishes visit us in the same way?"

"The mackerel and whiting are equally regular. The salmon, shad, and some other fishes migrate from the sea into different rivers for the same purpose, and are then caught for food by the neighboring residents."

"Flying and swimming seem to be really easy modes of traveling, mamma. Do any animals migrate that are obliged to walk?"

"Yes; I have read most interesting accounts of the land-crabs of the West Indies."

"Will you tell me about them?"

"They live in the mountains of the interior of the islands, but always deposit their eggs in the sea; marching in the most regular order, and with as much precision as if

some learned man had prescribed a straight mathematical line for their guidance."

"But suppose they come to walls or houses, mamma?"



LARG-CRAB.

"O, they think nothing of such obstacles; but patiently climb over them, and continue their journey so close together, that the ground is covered with them: and their horny shells produce the strangest noise as they move."

"Can they swim, mamma, if a brook crosses their path?"

"No; a river is therefore a very formidable hindrance; and they pursue its course for miles, till it is narrow and shallow enough for them to wade through."

"How long do they stay at the sea-side?"

"About six weeks; and then they march back again to their usual haunts as orderly as they came."

"Really, mamma, animals seem much more busy than I imagined."

"I must not forget to mention the swarms of locusts which devastate the countries they visit so fearfully, that their migrations are spoken of in Scripture as among the 'plagues' most to be dreaded."

"Ah, papa read a letter from uncle John at Smyrna, grieving over his nice garden in the country which some locusts had just destroyed."

"All writers agree in representing them as most voracious creatures, devouring not only vegetable food, but even the woolen and linen clothes of the peasantry as they are laid out to dry. Indeed, the curate of a Spanish village declared that, 'entering the church, they eat up all the silk dresses of the various saints' images, as well as the varnish on the doors and altars.'"

"What hungry creatures they must be, mamma! Do they walk as well as fly?"

"They can travel both ways, my dear. Of course, when seeking food they alight on the ground, and proceed so closely that you can see nothing but the moving, black carpet, as it were. When your uncle

John encountered a legion of these insects near Ephesus, he dropped a loaf of bread among them, to see how soon it would be eaten.

"And did they munch it up quickly?"

"In about ten minutes it was utterly gone."

"What crowds there must have been!"

"So many that, when they afterwards took flight, they darkened the air like a cloud, and the noise of their wings resembled the rustling of the leaves of large trees."

"Do they ever fly over the sea?"

"Sometimes they attempt it, to the great joy of the people whom they have visited; for, as they cannot fly far without resting, they are often thus drowned."

"That is a good thing. I think I should try and tempt them to the water, by placing their food near the shore."

"But wherever their bodies decay, the stench created is most intolerable; so that pestilence may be dreaded in consequence."

"O, mamma, how glad I am they do not come here!"

"So am I, Alexander; for it is literally as the Bible expresses it, 'Though the land may be as a garden of Eden before them, behind it is a desolate wilderness;' not only do they destroy present crops, but they injure the plants and trees so greatly, that for two or

three years afterwards they appear as if burned."

"What are these terrible migrations for, mamma?"

"Naturalists have as yet failed to discover, for they seem very fitful in their movements, and do not appear to be guided by any regular purpose."

"Do not bees migrate, mamma?"

"When a hive is too full, they swarm off, as it is called; but as in such cases they never return to their old homes, we must regard it as forming new colonies rather than migrating, which usually implies a return to some fixed haunt."

"Well, traveling is very pleasant; so if I were a bird I think I should like to be a migratory one, like the swallow: only I would not always go to the same place."

"All the migrations I have described to you, my dear, are strictly business journeys for a special object; so I think the poor swallow, who is condemned by a writer in an amusing account of his travels, must be exonerated from the charge of wasting his time, inasmuch as he fulfills his proper duty of providing for the welfare of his offspring, at the expense of considerable fatigue and trouble."

"But the locust, mamma, does not seem to have any useful business."

"If regarded only as a scourge sent by God in judgment, he doubtless accomplishes his appointed purpose, my dear boy; but if the stork in the heaven knoweth her appointed time, and the turtle and the crane and the swallow observe the time of their coming, let it not be said of us, as of the Jews of old, 'My people know not the judgment of the Lord.'"

"Cannot traveling be useful, mamma, without being on business?"

"Yes, surely; we may gain health and vigor for the body, and knowledge for the mind, while being also honored to convey the glad tidings of Jesus Christ's dying love to others. Christians whose circumstances permit those annual or occasional excursions, which are so delightful, should be careful to improve them by endeavoring everywhere to be witnesses for Christ, and to win souls to like precious faith with themselves."

CHAPTER VI.

WINTER QUARTERS; OR, HIBERNATION.

ALEXANDER WAS NOW growing a useful boy; and, though a great lover of fun and frolic, was so steady that his mamma could safely trust him to do many things for her abroad among her friends, and in the neighborhood.

One day he returned from some expedition with his bright face full of thought; and as soon as he had delivered the note he conveyed, he said, "Miss P—— showed me a number of curious things, mamma; shells and minerals. But what do you think there was in a corner of the parlor, snugly wrapped up in green baize?"

"Perhaps some little kittens, or a sick bird," replied Mrs. M——.

"No, mamma. Guess again: it had a shell."

"A lobster, or a crab, or a snail."

"*O, no, mamma,*" replied Alexander, laughing. "I do not think Miss P—— would take such very great care of them, though she is so fond of animals, and so kind to all she keeps. Besides, the creature I speak of had only four legs."

"I suppose, then, it was the tortoise that our friend has had so many years."

"Yes, it was, mamma; but it looked just as if it were dead, and yet Miss P—— said it was only asleep, and that it would not wake again for three months. Only think, mamma, what a very long nap! It had been asleep two months already."

"That long sleep is called *hibernation*, or winter rest."

"And does the tortoise take such a long sleep every winter, mamma?"

"It does, my dear; and many other animals also. The dormouse, the squirrel, the bee, the snail, the hedgehog, and the ladybird, all hibernate during the cold weather."

"Instead of migrating, I suppose: as some of them have no wings, that seems a better plan. But where are they, mamma? We never see bees, or snails, or ladybirds asleep in the winter."

"Bees are safe in their hives, and may be easily seen; but those who keep them cover them up, and do not like them to be disturbed by little peepers. Snails dig holes in the earth, and sink down so far as to be beyond the ordinary depth of frost; and then they shut up their shells with a glutinous slime, and remain torpid till the spring. You have seen lively little squirrels in the woods, in the autumn, skipping among the boughs of the trees; but when winter comes, they, along with dormice and hedgehogs, live in

the trunks of hollow trees, or have nests in the ground; so they have nothing to do but to stay at home and go to bed."

"But how do they get food all this time?"



HEDGEHOG.

"The squirrel, dormouse, and bee, with all the hibernating animals that require food, are taught by that great God who made them, to lay up a store of such things as suit them best; and when they are hungry they awake, and eat as much as they want, and then sleep again."

"Is that the reason that Mr. H—— always leaves some honey in the hives, when he takes the autumn stock?"

"Surely; he knows the poor little bees will need some food, before the spring flowers are plentiful enough to supply them sufficiently: but the first warm day after the snow is gone, you know, we see bees and ladybirds wide awake, and flying and creeping about to the early blossoming weeds."

"I have often watched them, mamma, and wondered how it was they were so very large; for I fancied all insects were new every spring."

"A great many are; but some live three or four years before they die of old age."

"But, mamma, Miss P—— told me that her tortoise never awoke till the end of the winter; so I suppose he takes no food."

"No; tortoises and some other animals exist entirely without fresh nourishment, but become lighter and lighter, towards the latter part of their torpor."

"Would a tortoise live all the winter out of doors, mamma? because Miss P—— said she was always careful to keep hers in a room where there was a fire in the daytime, though it was not near it."

"Tortoises are natives of warm climates; but they will nevertheless bear our English winter very well without so much care: they hide themselves in old walls, or burrow underground, like our squirrels and hedgehogs."

"How very curious this sleepy habit is, mamma! Do you think the animals require such a long rest?"

"No, I do not imagine that can be the reason; because some animals who, in their usual haunts, spend some months thus, when placed in warmer situations, do not sleep except at night. The field-cricket, for instance, hibernates in rural districts; but in the precincts of a country town, migrates, as it were, to the kitchen hearth, and there enlivens us with his cheerful chirp all the winter long. This winter sleep seems, therefore, a merciful provision for those animals that could get no proper food in that rigorous season, or that would die of cold if exposed to the air."

"Mamma, how do all these creatures know when it is time to rouse up again, if they are buried so deep in the ground?"

"That same wonderful instinct which causes those that require it to store up food, teaches them to awake at the proper season, when the warm atmosphere and the opening buds supply their necessities."

"I wonder whether a snail, or a dormouse, would wake any sooner, if anybody took the trouble to put it in proper warmth while it was asleep?"

"That experiment has been tried on some animals which could live on food easily fur-

nished by man; and they have been found to omit their long winter sleep, and seemed quite as well and happy without it."

"And if they could be kept in the cold too long, mamma, would they die, or only just go on sleeping?"

"Many interesting facts have been observed in answer to that question, my dear boy. Snails have been dried, and kept in one cold temperature for fifteen years."

"Have they? and did they live all this time?"

"Yes; and on soaking them in warm water they revived from their torpor, and appeared quite healthy and active. Toads also live to a very great age; and have been found torpid, and yet alive, in situations where they must have been deprived of food and air for nearly a hundred years."

"Where have they been found, mamma?"

"In the middle of the trunks of trees, or imbedded in blocks of stone."

"My dear mamma, how could they get there?"

"It is supposed, by naturalists who have examined and reasoned upon this subject, that they must have originally made a winter retreat there, and grown too large to get out in the spring; or else that the new wood of the tree, or the hardening of the stone, must have enclosed them."

"That seems very likely; but then one would expect them to die there. How is it that they have lived in such imprisonment?"

"It is this continued life which puzzles every one, and can only be accounted for by this wonderful power of hibernating, which we know may be greatly prolonged in the case of snails; and therefore it perhaps does not destroy the vital principle at all, without some other aid."

"Do you think that any of the sleepy poisons would kill animals during their hibernation?"

"Medical men think it most probable that any creatures in that state would suffer by all poisons in the usual mode, only perhaps not so quickly; as sleep generally retards the action of any substance upon the animal frame."

"It does not seem a very pleasant sort of life, mamma, does it? I should not care to live so long if I were shut up like those toads, and could enjoy nothing."

"As rational beings, Alexander, we should certainly not much value such a mode of existence."

"Do these poor prisoner toads seem to be old, compared to other toads, mamma, or do they look young when they awake?"

"They commonly look large and decrepit

and appear so weak and exhausted, that they have never been known to live long, when released from their tedious confinement."

"How long do tortoises and toads live in their natural state?"

"These animals are remarkable for the great age they sometimes attain. Miss P——, I think, said her tortoise had belonged to her father more than fifty years. The one at the Zoological Gardens was known to be more than seventy years old when I saw it last."

"Perhaps the winter sleep may rest it so much as to help to prolong its life."

"That is not unlikely; for though animals may sometimes miss their hibernation without appearing to suffer, it is very probable that, if deprived of it continually, their lives might be thus shortened."

"Do you know how long toads live?"

"I read yesterday an amusing account of one which had been kept by a gentleman thirty-six years. His father had had it long before him, and then called it 'the old toad.' It was quite tame, and very sagacious in its way."

"Did that sleep every winter?"

"Yes; it regularly disappeared for several months as the cold weather set in, returning again as soon as the warm spring commenced."

Did the gentleman watch where it went?"

"When he first knew it, it retired to some dry bank for hibernation; but afterwards, when he had some stone steps renewed in his garden, he had prepared several holes, with a passage to each about a yard long attached, which the toad seemed henceforward to prefer, and always came from one of these on the approach of spring. Its death was occasioned by accident: a raven attacked it, putting out one of its eyes, and injuring it so much that it only survived, in great suffering, for about one more year."

"Poor fellow! Mamma, do any birds sleep in this manner?"

"It is asserted by many ancient and modern naturalists, that the young of the swallow tribe hibernate the first winter, not being strong enough then to accompany their migrating parents."

"Really, mamma! But have they ever been found asleep, so as to make the naturalists sure about their habits?"

"Yes; great numbers have been discovered in caves on the southern coast of England, and also in some disused mines in Flintshire, fast asleep: some of whom revived when brought into a warm temperature. These were all very young, which seems to favor the notion I mentioned."

"I wonder whether they ever awake too soon, when a warm week sometimes comes in the midst of winter."

"Some have been occasionally observed at such times, my dear; but have disappeared again on the return of the cold weather natural to the season, as though their lurking-place were not very far off."

"I remember that papa read to you something about some creatures being fast asleep in those caves which were discovered accidentally."



"You are thinking, I suppose, of the bats which were disturbed when the travelers explored some Egyptian catacombs."

"Ah, that was what I meant."

"Bats generally sleep all the winter, fixing their hooked claws on to some dry roof, and covering their bodies with their leathery

wings, till the mild spring evenings invite them out to catch insects again."

"Do not snakes sleep very much, mamma? for whenever we go to the Zoological Gardens the serpents are always fast asleep."

"Most of the reptile tribes are drowsy—serpents particularly so. Indeed, the larger species never seem awake except when requiring food; and as soon as their hunger is appeased they sleep again, both in summer and winter."

"Ah, the boa-constrictor's keeper at the Gardens said he would not awake again till the next feeding time."

"True: and he is only fed about once a month; and yet we saw he was alive, by the action of his lungs."

"Do they only feed as often as that when they are living free, mamma?"

"Those who have watched their habits, and tried experiments upon them, assert that they are capable of fasting for a much longer period; but as they feel more and more famished they become proportionably more fierce, till every animal dreads their attack; while in their sleepy state they may be easily destroyed. Alligators and lizards also hibernate."

"What a strange, wonderful thing this sleeping is, mamma! Have any human beings ever hibernated?"

"No, my boy: though some persons have passed days, and even weeks or months, in a lethargic state, it is always in consequence of disease, from which the sufferer, if roused at all, awakes languid and unrefreshed. Man takes only short rests to recruit his powers, till the long slumber of death overtakes him."

"Death does not seem so dismal, mamma, if we think of it as sleep."

"To those, Alexander, who truly believe in and love the Lord Jesus Christ, and are pardoned and saved through him, the prospect of death loses all its gloom. Indeed, so gentle and harmless is it to all Christ's followers that he calls it sleep: 'Our friend Lazarus sleepeth.' And even of Stephen, dying amidst the heavy shower of stones, it was said 'he fell asleep.'"

"How sweet, mamma!"

"Very sweet! And our Saviour can say of all his people, as he did of Lazarus, 'I go, that I may awake him out of sleep.' What a glorious awakening will it be on the morning of the resurrection!—no longer to need the rest of sleep for the wearied body; no longer to fear the dangerous slumbers of the soul; for his people shall accompany their Redeemer to those mansions he has prepared for them; and 'there shall be no night there.'"

CHAPTER VII.

THE SILKWORM'S TEACHER; OR, INSTINCT AND
HER PUPILS.

Ms. and Mrs. M—— did not encourage their children to keep living animals, deeming it a species of cruelty to deprive them of liberty among their natural haunts. Occasionally, however, a wounded bird, or a half-starved kitten, was hospitably entertained, and carefully tended, till returning strength enabled each to resume its old habits and haunts.

One spring season a friend presented Alexander with a few silkworms' eggs: and he gladly obtained permission to rear them, and watch the wondrous changes of which he had read in some of his little books on natural history. He was delighted when the tiny black maggots first burst their shells, and supplied them liberally with mulberry leaves every day, well pleased to see the quantity they devoured as they grew larger and stronger.

One morning he was greatly concerned to find several quite inactive, and their evening meal still untouched; nor did they appear tempted by the fresh supply he offered them. "I hope they are not poisoned!" said

he to himself. "O mamma!" he cried, as Mrs. M—— just then entered the room, "what can be the matter with my poor silkworms? See how they have crept up into the corners of their box."

"They are preparing to spin their cocoons, my dear," replied Mrs. M——, "in readiness for their change into a chrysalis state. You had better put them into some paper cornucopias, as they always seek some snug nook in which they can suspend their silken nests."

Alexander produced some paper from his box of treasures, and his mamma showed him how to prepare some little round tapering bags, which she hung on a string; and putting one worm into each, desired him to leave them undisturbed for a few days.

"But, mamma," exclaimed the little boy, "who will show the silkworms how to spin a nest? for mine have never seen any cocoons, I am sure."

"The same teacher, my boy, who has instructed you in so many acts necessary to your well-being."

"Papa and you taught me all I know, mamma."

"Nay, Alexander; we should have despaired of teaching you all that instinct has taught you: and that will prove a far better teacher to the silkworms than any one else."

"You often speak of instinct, mamma; what is it?"

"The term instinct is generally applied to that *animal impulse which prompts* to any sort of action without being guided by reason."

"O, then, I should have thought that only animals would have instinct, because they have no reason."

"Animals certainly display instinct most strikingly and curiously; but man also shares in this faculty, though he is endowed with superior intellectual powers."

"How do people act from instinct?"

"Look at your baby brother now, Alexander; what is he doing?"

"Nothing very wonderful, mamma; only crawling about the floor, and trying to stand or walk by the chairs."

"A few months ago he did not attempt that, but lay still where we placed him. Do you think he has reasoned about his walking powers, and observed how other people place their feet alternately for the purpose?"

"O no, poor little fellow! I am sure he does not know enough for that; for when I try to teach him to speak, or to do anything with his hands, he does not seem to understand my lesson at all."

"Well, my child, instinct alone prompts

him to use his limbs, as they become strong enough. When a very tiny infant, too, who taught him to take his first food?"

"I do not know, mamma; for I did not see him take his first meal."

"I watched him, and you too, at this process; and you both seemed as expert as if you had enjoyed the best instruction in the art."

"Then I suppose we open and shut our eyes by instinct, without learning how to go to sleep, or awake again?"

"Surely! See, too, how cautiously your little brother lowers himself on the floor now he is tired of standing."

"Ah, he puts down one hand first," said Alexander, vowing to watch the infant, "and holds tight by the other. Now you are safe, little fellow."

"True; and if he feels in danger of falling, his hands are spread out to save himself, or break the violence of the blow, as carefully as if he were acquainted with all the mechanical laws of the universe."

"Still, mamma, do not children often imitate others, without knowing the reason for actions?"

"Certainly; and therefore I have only pointed you to those evidences of instinct in which every little child, from its want of reasoning powers, is as much isolated from

all other babies, as the infant Cain was, who could have no opportunity of imitating any similar being."

"I suppose Eve must have known by instinct how to take care of her baby; unless God himself taught her."

"God did teach her, no doubt, my love; but in the same manner that he still continues to instruct such myriads of his creatures, by implanting this unerring guide in them."

"Ah, I remember now you told me it was instinct which taught the birds to build their nests, and hibernating animals to lay up food if they needed it."

"True: every animal prepares its home, seeks its food, and provides for the welfare of its offspring, with unceasing care, and exact adaptation to their respective wants and habits."

"Does each kind always do the same things?"

"Yes; that is one of the differences observable between reason and instinct. Man degenerates or improves; but all the animals now known pursue precisely the same routine as their ancestors, of whom we have the earliest accounts. The beasts crawl over the earth, the birds fly in the air, and the fishes swim in the water, just as we read they did on their first creation."



RABBIT.

"I wish we had some description of their habits in those early times."

"Scattered about in the oldest books of the Bible, my dear boy, we have many incidental notices of the animal creation, which might apply with equal propriety to those of our own day. Mrs. King's doves exhibit the same antipathy to water, as the dove did which Noah sent out of the ark; and the raven, the rabbit, the ant, the lion, the wild horse, the ostrich, the sparrow, the swallow, and many others, still practice exactly the same peculiarities ascribed to them in holy writ."

"I never thought of that before, when reading my natural history of the Bible, and thinking how nicely it all agreed with

what I could notice now. To be sure, I read there what animals used to do two or three thousand years ago."

Mrs. M—— smiled approvingly on her little boy, as his countenance glowed with delight at this discovery. Presently he resumed:—

"Mamma, there is one thing which puzzles me: some animals live in confinement all their days, and have little opportunity of showing their natural habits."

"That is true, my dear; and they manifest a wonderful power of accommodating themselves to such circumstances—as do others, who, left wild, find some obstacle to their usual proceedings."

"How do you mean, mamma?"

"For instance, though birds always display a preference for one sort of material in their respective nests, if this is not attainable they will use some other: as the robin, which prefers oak leaves for the lining of hers, will supply their absence by moss or hair."

"And would the young of any animals who were prevented in this way from acting as wild creatures do, be exactly like their parents, or return to the habits most natural to their kind?"

"Generally, Alexander, the young of all animals exhibit the instincts peculiar to

their species; but a continuation of the circumstances which had altered the habits of their parents, would also promote a corresponding change in the young: thus kittens reared in the same manner as the domestic cats, which are their parents, are gentle and mild; but turned loose into the haunts of wild cats, soon become as savage as the original stock."

"Do animals ever change their food, mamma?"

"They show singular sagacity upon this point, invariably selecting that which is most wholesome: indeed, I have read that when afflicted with some temporary illness, they apply by instinct to those medicinal herbs suited to relieve their maladies; and early voyagers were accustomed to eat only those fruits which bore the evident marks of birds' pecking."

"Will not birds eat poisonous fruit, then?"

"No animal chooses food which is likely to injure him. I was once visiting at a gentleman's country house, where there was a very thievish rat, who displayed a marvelous taste for leather boot-straps; so that pair after pair disappeared most unaccountably. All sorts of tempting food was placed ready, covered with rat poison; this, too, regularly departed, but still the rat continued his depredations. At last, after a diligent search, he was taken

prisoner, and his cell examined, where all his stolen goods were deposited around in the neatest order. Different seeds piled in separate heaps, the missing straps, the poisoned bread and butter, each laid one upon another as evenly as possible."

"How very curious, mamma! But why had he not eaten his provisions?"

"Finding himself so well supplied every day, my dear, we supposed his instinct had led him to save this stock for some future emergency."

"Was he killed, mamma?—he almost deserved to have his life spared for his wisdom."

"So all the spectators thought, and even the injured party was mercifully inclined; but when the poor rat looked round, and found himself a hopeless prisoner, he gave one despairing groan, stretched himself out, and died on the spot."

"O, mamma, did you see him?"

"No; but I had my story from an eye-witness, and I visited the scene of the tragedy."

"Mamma, I wonder how other animals manage, if they have any unexpected difficulty in their ways?"

"Every book on natural history gives you interesting facts in answer to that question. A wasp, when trying to carry a

dead companion out of the nest, if he finds his load too heavy, will cut off the head and wings, and remove the body piecemeal. Ants are proverbial for their perseverance and contrivance in such circumstances."

"That is curious; but do you not remember our silly hen sat quite contentedly upon a nest of duck's eggs, and then was terribly frightened when all the little ducks ran away, and began swimming in the pond?"

"Well, my dear, that very alarm was the effect of instinct alone; for having no reasoning power to detect the difference between the ducks and her own progeny, she called them anxiously from the water, which she naturally dreaded for young chickens."

"I wonder whether she would have sat so patiently over a nest of imitation eggs?"

"O, yes; a hen has often tried to hatch chalk eggs, turning them over as carefully as real ones; but when, after a proper season, no chickens have appeared, she has abandoned them, and seemed to regard her duty as over; she has then returned to her roost again."

"I thought fowls always roosted at night."

"When the hens have eggs to hatch, or a young brood to cherish, they forego this

habit, and keep to the nest or hencoop till the young ones are old enough to roost with their parents."

"How very careful! Mamma, is it true that animals can foretell events, such as sickness and death?"

"Most animals, my dear, are remarkably susceptible of any change in the atmosphere; as you may see birds and sheep hastening for shelter at the approach of a storm, even while the sky appears clear and bright to you. Tortoises are excellent prognosticators of the weather."

"Indeed, mamma! I should have fancied, under its great tent-like shell, a tortoise would be quite careless about rain."

"An old writer quaintly assures us, that no fine lady could be more fearful of spoiling her dress by a shower than these well-sheltered tortoises."

"Still, mamma, that does not seem like telling of illness or death."

"It is probable that a state of air likely to cause fatal sickness among human beings, may occasion similar discomfort to animals; and their restlessness may have given rise to the notion, which was enlarged upon by superstition."

"If that is the real reason for animals seeming to know so much, perhaps those who live near burning mountains, or in

earthquake countries, give notice to the people that something is going to happen."

"We must not forget the sagacious instinct of asses in climbing the Alps, which has preserved numbers of persons from being dashed to pieces over the precipices."

"Why, mamma, donkeys seem the most stupid creatures in the world."

"Nay, my dear, in all mountainous regions they are greatly preferred on account of their sure-footedness; so that experienced riders now find their safest and easiest course is to let these animals find their own way."

"Really, mamma!"

"It has frequently been observed that horses and dogs are peculiarly uneasy under such circumstances. Indeed, the latter have in this country frequently been the means of saving human life, by pulling away the inmates from a tottering house, or in fetching help to the overpowered traveler."

"Like the good clever dogs of St. Bernard, mamma."

"Most animals are instinctively cautious of danger. Do you not recollect the interesting account of the elephant's voyage from India? When going on board the ship and landing again, neither blows nor bribes could induce him to venture across a plat-



DOGS OF ST. BERGARD.

form which he deemed too weak for his weight."

"O, yes; how he put one great foot on, and shook it time after time, till at last he seemed contented, and then he walked bravely over."

"Some insects display marvelous instinct in providing for the food of their future progeny: thus the *ichneumon* wasp lays an egg, and places over it twelve small caterpillars."

"Why twelve, mamma? Can she count?"

"When the young maggot bursts its shell, it feeds on these; and by the time it has eaten the twelfth caterpillar it changes into

its chrysalis state, when it no longer requires food."

"How very wonderful, mamma!"

"Other creatures are equally adroit in availing themselves of some neighborly help, to perform actions which are too much for their own strength."

"I do not quite understand that, mamma."

"The jackal will sometimes help the lion to his prey, and then expect a share. The pilot-fish always attends the shark; and the pinna is warned against her inveterate enemy, the cuttle-fish, by a little sharp-eyed crab, that always resides in his friend pinna's commodious shell, paying, as the price of his lodging, the warning news, which is always followed by the speedy and effectual closing of the sheltering shell."

"That is very fair and just, I think."

"The honey-bird will betray wild bees' nests to man and many animals, in hopes of sharing the spoil. It is common in Africa, where the Hottentots understand its habits so well that they continually avail themselves of its help, and invariably reward it with a portion of honey. It is said also to enlist the woodpecker in its service, who tears up the bark of the tree in search of the bees, while the honey-bird rifles the sweets of the combs."

"That is droll, mamma. I often wonder

what becomes of the bodies of dead animals; for we seldom see them."

"It has been considered a proof of instinct that animals usually retire out of sight when about to die a natural death; but I have read an anecdote of some bees, who, not being able to remove a dead toad, actually covered it entirely with such a thick coating of wax that no unpleasantness arose from it."

"Dear mamma, if we could but know all the lessons which instinct teaches, what very curious things we should find out."

"We should indeed, Alexander, discover, as Addison says, that 'innumerable artifices and cunning stratagems are acted in the bowling wilderness, and in the great deep, that never come to our knowledge.' The little we do know should rouse our love and admiration of God,

** Who taught*

*This skill beyond our reach of thought.**"

"It seems to me, mamma, as though animals and insects can do many things a great deal better than man."

"In their own prescribed path, my dear, they are perfect in skill; but man, you know, is endowed with a capacity for improvement, which, when cultivated, places him far above the instincts of the brute creation."

" Ah! and then, to be sure, animals have no mind, and cannot be taught anything about God."

" Nor do they seem formed to partake of that immortality of happiness which the Saviour has provided for all who, repenting of their sins, believe in his name, and seek to obey his commandments."

CHAPTER VIII.

THE TREASURY OF THE MIND; OR, POWER OF MEMORY.

ALEXANDER'S uncle W—— had returned from a long residence abroad. He brought with him his wife, an interesting Syrian lady of British parentage, who had, however, in early life spent so much time in England as to feel quite at home with her husband's relations; and by her intelligence, good humor, and sprightliness, soon rendered herself a general favorite with her young nephews and nieces.

One day she escorted a large party of them to see some animals, lately arrived at the Zoological Gardens, from those oriental climes to which she was still fondly attached. Alexander was one of the happy group; and he lingered near his aunt, greatly in-

terested in her remarks at recognizing some of the species familiar to her childhood.

As they drew near the tall building in which some handsome giraffes had been newly established, Mrs. W—— started, and exclaiming, "My native language!" hurried on to listen to its well-known accents. The Bedouin Arabs who had accompanied the giraffes from their eastern home were conversing with a gentleman who understood their tongue; and Alexander stood quietly, wondering what they could be saying to interest his companion so much.

At length the interview ended, and Mrs. W—— explained to her nephew, that her nurse was a Bedouin Arab woman, and that the first affectionate tones she could remember were in the language of these people. "I have never heard it spoken," she continued, "since I was four years old, and should have fancied it must have been forgotten long ago; but I understood every word as well as ever, and should have enjoyed talking with any one who knew the scenes of my infancy."

This little incident awakened Alexander's thoughts; and when he related it to his mother, at the close of his pleasant day, he inquired, "Is memory like instinct, mamma, that it can retain a language so long, with-

out people speaking it or continually thinking about it?"

"No, my dear," replied Mrs. M—"memory differs greatly from instinct, inasmuch as it belongs almost exclusively to the human mind, and may also be extended and improved."

"Cannot animals remember anything then, mamma?"

"Some of the most sagacious seem to possess either a kind of memory, or else a very refined instinct. Thus the dog and the elephant will recognize persons who have been kind to them, after some years' interval. They will also treasure up and resent an affront sometimes."

"I find it very difficult to learn my lessons, mamma; so I am afraid my memory is not much better than theirs."

"You perhaps find it difficult to remember particular words; but when you understand their meaning, I think you recollect ideas and facts very well. However, for your consolation, memory at your age is very capable of improvement."

"Is it, mamma? I often hear people talk of a good memory, or a bad memory; so I thought it was all chance."

"No faculty of the mind is the effect of chance, my dear: though God has endowed different people with different degrees of ca-

capacity, and very various tastes, yet, except in the melancholy cases of those afflicted with *idiocy or madness, all may be either spoiled, or improved by their own efforts.*"

"O, mamma, I should be very sorry to spoil anything God had given me; I would rather do all I could to improve even the *smallest talent. I wonder how aunt W—* learned so many languages; for do you know she can speak five quite well: English, French, Arabic, Greek, and Turkish."

"And her mamma, Alexander, could speak *seven languages by the time she was seven years old.*"

"Why, my dear mamma, she must have learned a new one every year."

"I have heard your aunt W— say that *such accomplishments are not at all uncommon among children in those large eastern cities; such as Smyrna, Constantinople, and Alexandria, which are much frequented by foreigners from all parts of the world. Nearly every week new travellers are the guests of resident gentlemen, while the servants speak the native language; so that the children learn to converse with their parents in one tongue, with their attendants in a second, and with their friends perhaps in three or four others.*"

"Can they read them all, as well as talk in these languages?"

"Not at so early an age. They must learn all the various characters and grammatical constructions, to enable them to read and write these languages correctly; and this of course occupies considerable time."

"Then, mamma, I am afraid I should forget one language, while I was learning another."

"There might be some danger of that, my dear Alexander, were it not for this wonderful faculty of memory. God has so constituted our minds that we can treasure up various items of knowledge, when once thoroughly acquired, and leave them for future use without taking any further trouble about them. A late member of parliament, eminent for his successful efforts in the house on behalf of many valuable objects, writing to his younger son, says, 'The passage of my speech last night which was best liked was a quotation picked up by me some thirty years ago, when I was a youth, planted in my mind, and there it was when I wanted it.'"

"How very convenient!"

"It is astonishing how such things are recalled; at some distant interval, perhaps a sentence of the same kind, or a trivial incident, rouses up all you have learned, and memory faithfully presents it ready for immediate use."

"Just as the Bedouin keeper of the giraffes reminded aunt W—— of her nurse's language, and way of talking to her."

"Exactly, my dear. And you yourself have not continually to repeat over your Latin and French lessons, to be able to apply them in your exercises; nor do you require incessant thought about the multiplication table, to keep your calculating powers alive."

"No, mamma; I should have no time to learn anything new, if I were obliged continually to repeat over all I knew before."

"Memory is like the mind's storehouse, Alexander; but its usefulness and beauty will depend much upon the value and arrangement of its contents."

"How do you mean, mamma?"

"I will explain, my dear. Your little red trunk may be very full, and yet worth very little."

"Why yes, to be sure, mamma; it might be full of rubbish that would be of no use to any one: but then I should empty it out, and put in something better."

"Well, and when you have put in something better, it might still be full even of useful and valuable things, but all in such confusion that you could never find what you want."

"Nay, mamma, that would be hardly

better than having it full of rubbish; because the valuable and useful things would be of no service to me if I could not find them at the right time."

"It is just so with the memory, my boy. If you fill it with wicked or idle knowledge, it had better be empty; and if you store it with scraps of wisdom all jumbled together in confusion, that would be scarcely more useful, and certainly not render you an agreeable or instructive companion as you grow up."

"I am sure I should not like my memory to be empty, mamma; so I will learn as much as I can."

"But take care you do not overload it, or, like your treasure-box, sometimes its contents will be tumbled out again and lost."

"My box will hold a great deal, you know, mamma, when I put it all neat, and sort the different things in it properly."

"True; and so it is with the storehouse of the mind. Memory will retain a vast deal more knowledge when nicely arranged, and laid up in various compartments."

"How can people keep their mind's storehouse orderly, mamma? that is very puzzling."

"It is for this very purpose, my dear, that we allot certain hours for your different pursuits; so that when one set of lessons

is learned and understood, they may safely be dismissed from your present thoughts, and yet will be ready for application and use when wanted."

"Ah, I learn my grave things in school hours, and more amusing things on holidays, and when I walk out with you, or go to some pleasant curiosity place with papa."

"Moreover, Alexander, memory, like all our other faculties, gets tired after a while; so it is desirable not to keep it too long fixed on one subject, but to vary its duties."

"I can understand this, mamma, for I used to feel very tired when I was obliged to repeat the very words of the book at school, whether I understood them or not; but since I have been allowed sometimes to use my own language, my lessons are much more interesting."

"When you have once comprehended the thought or fact your lesson contains, the words which express it are easily remembered. But you are now older, too, and therefore more capable of mental exertion."

"Does memory grow, mamma?"

"Its power generally increases as the mind and body become matured, especially if it is judiciously trained."

"Mamma, when I had that bad fever last

autumn, and was so weak at first, I could hardly remember anything; how was that?"

"When the body is affected by disease and weakness, it is no longer able to obey the mind, and sometimes seems almost to shut it up; so that people lose all consciousness for a season. Sometimes the memory alone suffers."

"How curious that is!"

"It is another proof, my boy, how marvelously and delicately our frames are constructed for the use of the soul:—

—'That noble guest within,'

as a poet truly calls it."

"Grandmamma often says her memory fails; is that because she is weak?"

"Aged persons frequently complain of this effect of their declining strength; and yet, if you remind them of early scenes, they retain all they learned in their youth with wonderful accuracy."

"I should have thought they would forget what they had learned so very long ago."

"It does not seem so. Memory is more susceptible, and takes much stronger impressions, in early childhood, than at any time in after life."

"What delightful stories grandmamma tells of her young days, and the books she read, and the animals she noticed then! I



am always so glad when she is well enough to talk to me."

"And have you ever noticed what very slight incidents will remind her of events and people long ago passed away? just as if you took a bunch of keys into the *store-house of the mind*, and unlocked first one drawer and then another, with different-shaped keys."

"Let me think," said Alexander, pausing. "O, yes; this very morning, when I took some flowers to grandmamma, she said one

of my questions reminded her of her mother's answer to herself, when she was a tiny little girl, more than sixty years ago."

"Then only think, my dear boy, if memory forgets so much that is learned in after life, and remembers so distinctly what is acquired in childhood, how very important it is to get correct knowledge then."

"It is indeed, mamma. I will take more pains to learn my lessons perfectly, I think; and then any little thing that reminds me of them, when I grow an old man, will remind me of something true and good."

Mrs. M—— repeated:

"It is not to say what will bring to the mind
The joys that are past, or the friends left behind;
A tune, or a song, or the time of the year,
Strikes the chord of reflection, and means in the ear."

"Dear mamma!" resumed Alexander, "what a number of things can be treasured up in the memory! But though we can easily remember the sound of music, do you think people can recollect how to play it? because, you know, this seems to be the work of the fingers on the organ or piano, or of the mouth upon the flute and trumpet."

"Music and drawing, I believe, my dear, may be long laid aside, and then resumed again; though doubtless fresh practice would be requisite to render persons expert performers."

"When is our memory strongest, mamma?"

"Probably about your age, my boy; though it must be in very active exercise during infancy."

"O, mamma! can our baby, who is only just beginning to talk, have an active memory now?"

"Surely, my dear; or how do you imagine he learns the names of the objects around him?"

"Why, it seems so natural to say 'juss' to the cat, and 'bread,' or 'milk,' when he is hungry or thirsty."

"Nay; then why do not little French or Hindoo children use the same terms for the same objects?"

"I never thought of that."

"There is no real connection, you know, *between names and things*. We fix upon certain words, and use them by common consent to point out particular objects; but all these are quite arbitrary, and so different in different countries that they must be learned by an effort."

"Then little tiny children are really learning a great deal, mamma, before they are *old enough to read, and have regular lessons from books*."

"Certainly; and we may form some idea of the exertion and pains needful to learn to

talk, by noticing our own difficulty in remembering the names of persons or places, plants or animals, of which we never heard before."

"That is very difficult, mamma. How puzzled I felt when papa took me to the British Museum! I could only recollect a very few of the easiest names of the curious things I saw there."

"Then again, in learning to read, the memory has to treasure up an entirely new set of symbols, in the shape of letters and words."

"Writing-letters, and figures too, mamma, as well as printed ones! Why, what should we do without memory?"

"We should be no wiser than brutes, my dear, who are almost destitute of any capacity for improvement."

"Dear mamma, I have just thought of something else: I suppose every time we learn a new language, all this hard work poor baby is now learning must be begun again?"

"Just so, Alexander; only many languages are so connected that they seem easier and easier, the more we become acquainted with them."

"What a good memory that little boy must have had, who lectured on astronomy the other evening, mamma! He told how far

off the sun, and moon, and planets were, without looking at any book."

"True: and his lecture was an effort of memory alone; for when he visited us, and your papa conversed with him, we were surprised to find that he seemed quite unacquainted with the general science of astronomy, and could only answer questions in the words of his lecture, or else confess he did not know anything about the matter."

"That sort of knowledge would not be very useful to him, I think."

"Why, no; a magpie or a parrot could repeat its lesson correctly, but that is all; or the learned pig pick out the letters requisite for spelling a few words: but they soon expend their apparent wisdom, and have no faculty for acquiring more."

"Well, I should not be satisfied with only learning like a bird or a pig."

"Then, my dear boy, you must endeavor to compare and weigh the treasures of your memory, rejecting all useless lumber, and retaining that which may benefit yourself or others during your future life."

"Mamma, will memory last forever?"

"The Scripture leads us to expect it will. Indeed, many dying persons have declared that, even at the close of a long life, every event, and almost every speech of their past course, seemed all brought vividly to their re-

collection, as they felt that they were about to render the account God says he shall require of every man. And our Lord, in his striking narrative of the judgment-day, as recorded in the twenty-fifth chapter of Matthew, seems distinctly to recognize the memory as in full activity."

"Ah, mamma! how happy will those be whose sins God will 'remember no more,' as my text says; but the wicked, if they recollect all their sins, and feel there is no blotting out for them—O, how sad!"

"Sad indeed, my child! Memory will then prove like the worm that dieth not, and the fire that never shall be quenched. In fact, the punishment of the wicked often begins in this life, when the recollection and the remorse for crime sting the conscience, permitting no rest day or night, till the wretched being is almost mad with distress; unless God touch his heart, and lead it to rest in faith on the atoning blood of Christ; so that to the reproach, 'such were some of you,' the consoling assurance may be added, 'But ye are washed, but ye are sanctified, but ye are justified in the name of the Lord Jesus, and by the Spirit of our God.'"

CHAPTER IX.

THE HERMIT CRAB; OR, ANIMAL DEFENSES.

Mrs. M— was sitting quietly at work when the door opened, and Alexander made his appearance. He had been rambling on the beach with his little brother, and held in one hand their basket of shells and seaweeds, while the other carefully guarded something which seemed to excite great wonder; and opening his fingers cautiously, he displayed a young animal with most formidable-looking claws, peeping out of a yellow shell.

"What can this be, mamma?" asked the little boy; "it is quite different from any other fish in this kind of shell. Look! it has claws like a lobster."

"It is one of the smallest of the crab tribe, my dear," replied Mrs. M—, "and is called the *hermit*, from its practice of living in any empty shell it can find."

"O! then I may turn him out without any danger of hurting him, I suppose. Come, sir, a little farther—you seem almost out; I will help you." So saying, Alexander took hold of one claw, and gave a gentle pull; but to his surprise the limb came off in his hand with a sudden jerk.

"O, mamma!" cried the boy, "I am afraid I have hurt the poor little creature."

"I hope not," answered his mamma; "it is one of the peculiarities of lobsters and crabs to be able thus to throw off a claw, which will be shortly replaced by a new one, if the animal lives. But this seems to have been out of the water so long, that it is very nearly dead."

Just then the little hermit tumbled lifeless, quite out of his shell; and Mrs. M—— pointed out the small hook at the end of his long tail, which had enabled him to keep possession of his habitation.

"But, mamma," inquired Alexander, "why does he choose somebody else's shell?"

"Not being furnished with any defense of his own, my dear," replied Mrs. M——, "his instinct teaches him to borrow from his neighbors."

"But does he not want a larger house as he grows bigger?"

"Yes; and it is a most amusing sight to watch his search after new lodgings."

"I should like to see him do that. How does he manage?"

"We crawl along the beach, carefully turning over the empty shells thrown up by the tide, and trying on first one and then another, till he has found one to suit him."



THE HERMIT CRAB.

"Suppose they were all too small, or too large, mamma; would he go without one?"

"O, no; he never discards his old house till he has provided himself with another."

"How can he drag it along?"

"By means of this tiny hook at the end of his tail, which seems given to him for this very purpose."

"How curious, mamma! Do all crabs live in shells, or holes in the rocks?"

"The other creatures of this kind have a firm shell of their own, which is changed as the animal grows, and a new one secreted at regular seasons. Their large toothed claws are able to inflict severe wounds upon their enemies."

"Are all these pretty shells, then," said Alexander, emptying his basket, "made for the animals' houses?"

"You may call them either houses or shields, my dear, as they seem intended for defence as well as shelter."

"Snails live in their shells; so they must be their houses."

"True; but when winter comes they burrow under-ground for hibernation, and often hide themselves under stones or leaves, lest the birds should swallow them, shell and all; and even these limpets and whelks shelter under the thick sea-weed on the rocks."

"Well, then, we must call the shells their shields, I suppose. How many different shapes they have!"

"Shells are usually divided into three classes: univalve, consisting of one piece, like the limpet, whelk, and cowrie; bivalve with two pieces, such as oysters, mussels, and the enormous clam tribe."

"I remember seeing some clam-shells in

Mrs. L——'s shrubbery; they were very large, and held a great quantity of water."

"Those were but small specimens; this creature often weighing four or five hundred pounds, while the sudden closing of its enormous toothed valves will snap asunder a strong cable."

"That is a formidable shield indeed! But you said there was a third class of shells, mamma."

"Multivalve, comprising all shells which consist of more than two pieces; such as the acorn-shell, and pholas of the rock. Some completely encase the inhabitants, having holes for the head and limbs."

"What kind of animals can they be?"

"Such as turtles and tortoises."

"What! are your pretty tortoise-shell boxes and combs really made of the shells of such creatures as Miss P—— showed me in her parlor last winter?"

"Certainly, my dear, as their very name imports."

"But, mamma, Miss P——'s tortoise was of a very dull color, not at all like the beautiful brown and amber mottled look of your card-case."

"Very likely, because the shell is split into thin layers for use, so as to exhibit its beautiful structure, and polished also by the art of man to increase its attractions;



COATED SHELLS.

while upon the living animal you see its thick, dull surface, far better suited for its use and defense than if so brittle as my comb."

"Is turtle-shell as pretty?"

"No, it is not near so handsome; and, not being so delicate in its construction, is much less esteemed for our use, though of equal service to the turtle."

"Some of the shells at the British Museum were shining, and marked with beautiful colors, while others were dull; how was that?"

"Many shells acquire a natural polish as they arrive at maturity; others are covered with a thick cuticle, and do not exhibit their splendid hues till that is removed."

"What are shells made of, mamma?"

"It has been ascertained that most of them are composed of two substances: one a sort of lime, or flint secretion, something like the material of our bones; and the other portion of animal tissue, full of veins and arteries, which, during life, convey nutriment."

"What does the shell want nourishment for?"

"To increase in size with the enlargement of the animal."

"I forgot that most creatures are smaller when young. Indeed that does seem a very puzzling question, how to make the shell fit well at all times without having a new one; how is that contrived, mamma?"

"When first hatched from the egg, all shell-fish have a small habitation ready formed; and God has endowed them with the power of secreting fresh material, in exactly the form most suited to their convenience, so that each year, as the little creature grows, his house is enlarged also, and accommodates him as well as ever to the last moment of his life."

"And how are these shells fastened on, mamma?"

"By a variety of muscles, differing in different animals. The snail's shell is bound to him by bands passing round the middle

of his body. Others, such as the nautilus, appear to reside in the hood, or wide opening of the shell. Some animals are attached to their habitations differently as they grow older, possessing the power of discarding that portion of shell which, when outgrown, is of no further use."

"That is very wonderful: how do they manage that?"

"It is not known how; but shells are perceived to be thinner in the inside, or to wear so completely changed an aspect, that they have been formerly regarded as belonging to distinct species."

"That is very strange."

"Crabs and lobsters, I believe, change their shells entirely as they grow older, though the new one has a precisely similar form."

"Do they pop into one that another has left empty, like the little hermit crab?"

"O, no; they throw off their small shells, and then are obliged to wait till a new one grows over them."

"O, mamma! but suppose any great fish should eat them up while they have no shell?"

"It is said that they retire into very secluded nooks while in so defenseless a state."

"But how long is it before a new shell grows?"

"It is completed, I believe, in two or three

days; and during this time the animal is almost torpid, so that it does not need to expose itself in seeking food."

"How often do they change?"

"Probably once a year is often enough for their comfort."

"And do tortoises change their shells too, mamma?"

"No, they would find it a very difficult task, as their shell is made of several separate plates, jointed together by strong horny edges. God has ordained that these plates shall enlarge by a fresh deposit of horn at the edges, so that as the animal grows his shield also becomes more roomy."

"How kind all these plans for the comfort of fishes are; for most shell-fish are so very ugly!"

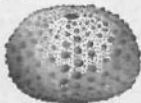
"God provides, you see, for the happiness and convenience of the meanest of his creatures, however plain they may appear in our eyes."

"When I was on the beach this morning, mamma, a gentleman passed me with a great shell like a ball in his hand; what could that be?"

"The shell of the echinus, or sea-urchin, my dear; it is sometimes covered with prickles, and presents a most formidable aspect to its little enemies. The star-fish has a rayed shell, armed in a similar manner."

"Do all fish have some defense of this kind, mamma?"

"All which are not capable of defending themselves by superior strength, as the whale and shark can."



THE SKIN, WITHOUT ITS SCALES.

"What do they have—shells?"

"Some have a thick skin, others a short fur, as the seals; but the most common armor of fish consists of bony scales, laid one over another so as to protect them very effectually from common dangers."

"Is it these scales that make such pretty colors on some fishes?"

"They have something to do with their hue; but when examined separately, each scale looks like a little piece of delicate ivory, formed in different shapes in different species, and requiring thousands and thousands to cover one small fish."

"And do they all grow on them just as shells do?"

"Yes; and by just picking up a few of

these fish-scales, and trying to arrange them in proper order, we shall learn to admire still more the wisdom and skill which God has displayed in causing their natural growth."

"Why, mamma, the fishes' clothing seems almost as wonderful as birds' feathers."

"It is quite so, my dear; so light and so thin, yet so hard and durable. I have seen artificial flowers made of fish-scales, and, till I inquired, could not imagine of what elegant material such exquisite sculpture was prepared."

"Really, I will try and get some different sorts of fish-scales the next time I go to the fish-market."

"Do so; and we will ask uncle Henry to show them to us in his microscope. Then, Alexander, some fishes are armed with spines, like the stuffed porcupine-fish your grandpapa has."

"O, I remember what sharp prickles those were; sharp enough to kill any little fish for its dinner."

"Sharp enough, too, to inflict terrible wounds upon men, as some savage nations use these spines for arrow points. The sword-fish, you know, has a long bony projection, armed on each side with such sharp teeth that it has been known to pierce through the bottom of a boat, and even of a large ship."

"They must be formidable creatures, mamma."

"Have you ever felt a shock of electricity?"

"Yes indeed, mamma; and it seemed to take away all my strength, as though I had had a terrible knock."

"Well, some fishes are endowed with the power of giving their enemies an electric shock."

"Why, mamma, that is more wonderful than anything you have told me yet. What sort of fishes are they?"

"There is a species of eel and of ray which possesses this remarkable property."

"And can they give electric shocks to people, mamma? for I should think we could not catch them."

"They affect the human frame so powerfully, that the fishermen usually permit them to exhaust themselves before attempting to catch them. There is another curious mode of defense practiced by the cuttlefish."

"Please tell me what that is."

"It spurts out a black fluid, and so dyes the water as to escape unobserved beneath."

"That is a droll way of hiding."

"The sea-nettle, too, I have been told by many fishermen, blisters the hand badly, when taken up during its lifetime."

"Perhaps that is why it has that name. But, mamma, how do land animals fight their enemies?"

"When you affront pussy, what does she do?"

"Scratch me with her claws, to be sure."

"Let us look at these sharp weapons. Puss, puss!" said Mrs. M——: and the sleek animal jumped purring upon her mistress's lap, and patiently allowed an examination of her feet. "I do not see the claws, Alexander: feel how soft her velvet paw is."

"Yet, mamma, I am sure she has claws. Yes, there they are, peeping out: but how nicely they are kept in that firm glove, when she does not want them."

"Many animals possess this scabbard, and similar weapons in it: lions and tigers, for instance. They have also formidable teeth, which alone can kill their prey."

"The good-natured elephant and great rhinoceros, I suppose, find their tough skins defense enough."

"Nay, my dear; think of their long tusks, on which I assure you, in their wild state, they do not scruple to catch and transfix even a tiger."

"O! I never thought of anything so terrible as that."

"Moreover, we have not yet mentioned the hedgehog's bristles, or the eagle's talons."

"I have seen a hedgehog rolled up like a ball of spikes: but I have not seen eagles' talons, mamma."

"You must notice them the next time you see any specimens of the tribe. Many birds possess beaks, which are not to be despised as weapons of defense."

"How a large goose, too, can strike with its wings! And, mamma, the wasp's sting that made my finger so sore and swelled: I am sure I shall always be afraid to attack wasps again."



FANG AND TONGUE OF A RATTLE-SNAKE.

"Then there are the poisonous fangs of snakes, occasioning speedy death to their victims."

"Mr. P—— told us about the sad cases he saw from their bites in India, mamma."

"Many insects sting fearfully—such as the scorpions and centipedes of tropical climates; and even here the sting of a bee or a *gnat is painful; but to sheep and horses and cows, these and similar insects are sometimes so annoying as to cause their illness and death.*"

"What was that little creature Mr. T— was saying so tormented travelers in the West Indies?"

"You mean the chigoe—a tiny kind of flea, which places itself so quietly and skillfully *under the skin of the leg or foot as not to be perceived, whilst perhaps it has succeeded in depositing a little bag full of eggs which occasions an intolerable irritation; and as the eggs are hatched, the multitude of little chigoes will cause most painful ulcers, unless they can be entirely removed from the part affected.*"

"How very uncomfortable!"

"Then, again, you remember how painful your blister was."

"O yes; I hope I shall never need another."

"That large blister was raised entirely by the powdered fragments of *cantharides*, a Spanish fly."

"And can they blister the skin when alive?"

"Yes; this property is their mode of de-

fense; and so effectual is it, that great precaution is necessary to catch them."

"Are they large flies, mamma? How are they caught?"

"They are about the size of common black beetles, but of a splendid green and gold color. They are found upon the laurel-tree in various parts of Europe: sometimes indeed they have been captured in England. Those who seek them, carefully veil their faces, and encase their arms and hands in stout leathern gloves, while they sweep them into close baskets while the insects' are asleep. They must do this very quietly, as the slightest contact with the skin will raise a painful blister."

"Well, mamma, there seems no end to the various weapons of defense."

"One more I must mention; and that is, the power possessed by some creatures of overpowering their pursuers by a dreadful fetid effluvia, so that it is almost impossible to endure it; and the victim thus escapes, while its enemy is half dead with sickness and disgust."

"Thank you, mamma. What a number of interesting things my poor little hermit crab has made us talk about! I must never forget all these shields and weapons."

"May you then, my boy, be careful to seek the shield of salvation, by faith in the

Lord Jesus Christ, that you may be able to withstand all the assaults of that evil one who 'goeth about as a roaring lion, seeking whom he may devour!'"

CHAPTER X.

THE GOLD-FISHES' BREAKFAST; OR, MICROSCOPIC WONDERS.

The large fish-globe had just been filled with fresh water, and its brilliant inmates were swimming about, enjoying the clear element; now diving below, then rising rapidly to the surface, and exhibiting an activity and earnestness which rather perplexed the little boy, who had watched the process with great interest.

"Mamma!" he exclaimed, as Mrs. M— placed the vase on a table near an open window, "what are the fishes doing? They are opening their mouths, and swimming about, as if they were catching something."

"So they are, my dear: no doubt making a hearty breakfast on the fresh provisions with which I have just supplied them."

"What provisions, dear mamma? you have not given them any food but water."

"Indeed, my dear, you are mistaken; I

have given them an excellent meal, enough to last them for a day or two."

"They must have munched it up very quickly, then; for I can see nothing but water in the fish-globe."

"No, they have not finished munching yet," replied Mrs. M——: "look how busy their little mouths are."

"They can be only gaping, mamma; for see! there is really nothing to eat."

"The truth is, your eyes are not sharp enough to perceive the food they so enjoy."

"But you often say my eyes are sharper than yours, mamma. Can you see what the little creatures are eating?"

"No, my boy, I cannot; for gold-fish, like many other small animals, live upon animalcules—that is, insects so tiny as to be invisible to our eyes without assistance."

"But how do they catch these tiny insects?"

"They are furnished with a fringe of very minute hair, like feelers, which are constantly sweeping the waters."

"Do they sweep the animalcules into their mouths, then?"

"They move them so as to create a little whirlpool in the water, which is very helpful in catching their prey."

"And have all little fishes these tiny feelers, mamma?"

"I believe so. They are very beautiful in mussels and oysters, and supply them abundantly with food. As they are seen, too, in all the larger animalcules, naturalists reasonably suppose that the smaller species also have similar convenient appendages."

"I should like to see some of these little creatures, mamma."

"There is an instrument called a microscope, Alexander," replied his mamma, "which has glasses fixed so as greatly to magnify the objects we look at."



THE MICROSCOPE.

"Uncle Henry has a microscope; so we can ask him to lend it to us."

"Uncle Henry's microscope is not sufficiently powerful to display the very tiny in-

sects which gold-fish find in this clear water. But," continued Mrs. M——, turning to the bookcase, "here are pictures of several which have been seen by larger instruments."

"O, mamma!" cried Alexander, looking at the engravings, "what very queer-shaped creatures! Can these really live? some like cups, others like wheels."

"In the solar microscope at the Polytechnic Institution, I have seen many such beings alive, chasing and destroying one another as actively as larger beasts of prey."

"What! do they eat one another?"

"Yes. There are various sizes, even among these tiny creatures, that are too small for us to see; but a gold-fish, you know, would seem like a great whale in comparison, and no doubt devours all indiscriminately."

"I wonder whether they are as intelligent as larger animals?"

"They appear to have as much sagacity as they need, and, to judge by their actions, are as capable of feeling pain as sheep or cows."

"O! dear mamma, how can that be?"

"When I saw the inhabitants of a drop of ditch-water, Alexander, in a very powerful solar microscope, I observed that none got into each other's way, but that the smaller

insects tried earnestly to escape the open jaws of those larger creatures which chased them. Moreover, when two of equal strength met, they had a tough battle before either would yield."



ANIMALCULES IN A DROP OF STILLSTANT WATER.

"And did either conquer at last?"

"You shall hear. After a long struggle, the most powerful succeeded in wounding his enemy; and then it was quite affecting and painful to see the vital fluid pouring from the wound, and the poor vanquished *for becoming fainter and fainter, till at last death closed its distress.*"

"I am sure if I were to see such a sight as that, mamma, I would be very careful not to hurt even the tiniest insect. Do flies and spiders have real bones in their limbs, mamma, like larger animals?"

"Certainly; and these are joined together in the most exquisite manner, so as to enable

them to pursue their occupations in the most convenient way."

"And are their eyes made like ours?"

"Some of them are; but many insects are furnished with organs of sight much more delicate and complicated than our own, enabling them to perceive objects which are quite invisible to us."

"I suppose, then, the gold-fish can see the tiny insects he eats."

"No doubt he can. The more minutely these little creatures are examined, the more wonderful seems the provision for their comfort, happiness, and protection. Look at these drawings. Is not that a beautiful wing?"

"It is indeed, mamma. What a very great number of little bones it seems to have, to stretch it out so wide."

"That is the wing of an earwig."

"I did not know earwigs had wings, mamma."

"Very likely. They are not large, and, when not in use, are folded up in such very small cases that naturalists were long before they discovered them."

"How thin and transparent the skin that covers them seems!"

"And yet this delicate gauzy wing is filled with innumerable little vessels, conveying a nourishing fluid to maintain its health and

use during the animal's lifetime. So also are the wings of the dragon-fly, gnats, and other



DRAGON-FLY.

insects. Some, too, have their wings garnished with a fringe of delicate hairs, to protect them from dust or rain."

"Mamma, these very tiny creatures seem almost more wonderful, I think, than the great planets and stars."

"We know much less about the planets and stars, my dear; but it is very cheering to us poor, frail mortals to discover the exquisite skill and tender care with which the same God who built the skies is ever preserving such very minute atoms of life, is it not?"

"Indeed it is, mamma. I shall never now be afraid of God forgetting me, when I look at an insect."

"His own word assures us that the hairs of our heads are all numbered. But not

only are insects' wings curious, Alexander, but their *wing-cases* exhibit very various contrivances, and great diversity of ornament when examined by the microscope."

"All that I have seen with my own eyes look alike, I think; rather horny, only of different colors.

"The different colors are, I believe, chiefly occasioned by the various shapes and dispositions of the scales composing these sheaths."

"I remember you told me that fishes had scales, but I did not suppose insects had too; they must be very small."

"In our useful encyclopædia, my dear boy, are some drawings of various fish-scales greatly magnified, with the natural size also drawn in contrast. See how different they are."

"O! here are eel-scales, and those from a sole and perch: they are very pretty. One is fluted, with cross-bar marks as well; long, square, and round-shaped too."

"These scales are disposed over one another in several methods: some, which are small, overlapping like the fishes' scales; others, larger in proportion, fitting the insect's body as accurately as any plate armor."

"Are insects' scales as differently marked as fishes' scales, mamma?"

"The difference already observed between



them leads to the supposition that there is equal variety; but some of these scales look soft, and will come off like dust on your fingers when you touch an insect's wing."

"After I have caught a moth or a butterfly, mamma, I have seen red or yellow powder on my hands; is that powder scales?"

"Yes; scales almost like very small feathers, my dear, and differing greatly in shape on different insects, and even on various parts of the same insect."

"Mamma, do you think butterflies' feathers are made as curiously as my peacock's feather?"

"Some naturalists say that there is a much greater variety of contrivance and elegance in the clothing of insects, than is to be found amongst birds. The moths furnish a proof of this fact. Here is a picture of the twenty-plumed moth, in its natural size, and magnified."

"O, that is strange!"

"The butterfly's plumage is too small to be examined so minutely as that of birds, with our comparatively clumsy instruments; but there is evidently a shaft, and distinct filaments: whether they are quite so elaborate as the peacock's or the eagle's is not yet found out."

"I dare say bees' hairs are curious things in the microscope; because we can see them plain enough without help."

"True; but if you take single hairs from different creatures, the microscope reveals a great diversity in their formation."

"Indeed, mamma. Is not all hair alike?"

"Human hair alone varies in shape, some being round, and some square or triangular. It is hollow like a long tube, and has a root at one end, whence it derives nutriment from the skin; and at the tip it separates into a little tuft of slender filaments."

"Really, how curious!"

"The fur of the bat has knots like the beginning of tree branches; while the hairs of many caterpillars display spines at regular intervals."

"Well, I should never have guessed that hair had so many shapes."

"The fine soft fur of the mole is singularly adapted to its habits, being composed of little bars, crossing at intervals, so as to yield in all directions. It can therefore run either back-

wards or forwards in the narrow passage leading to its hole, when it is frightened, without the least difficulty."

"Would fur made like that of other creatures, then, hinder its doing so?"

"Yes; in most cases the fur would be strong enough not only to catch any projecting stone, and thus delay its progress, but it would also brush down the loose earth so as to choke up its path."

"Then I suppose fur is generally made to lie only in one way, like feathers."

"That is the case with most animals. Pussy, you know, does not like to be stroked the wrong way; and your hair will cause pain if forced in the opposite direction to its natural growth."

"The cat never seems to like having those long hairs on each side of her mouth touched. I wonder what they are for."

"Naturalists seem still rather doubtful about them, my dear; they are supposed to act the part of feelers, in *one* respect. As they hunt for mice in the dark, and these whiskers project on each side about as wide as her body, pussy knows when the passage is too narrow for her to pass."

"Those whiskers are stiffer than common hair, I think, mamma."

"They partake more of the nature of the bristles which clothe pigs and hogs; and are

stiff enough, you know, to make brushes. Anatomists also remark that they are fixed into a light, fleshy substance, so thickly beset with delicate nerves that the slightest touch is instantly communicated to the brain, rendering pussy a model of caution and prudence."

"Some plants are covered with hairs, mamma; are they at all curious?"

"Those of the stinging-nettle are so contrived as to convey a minute drop of irritating poison, which is squeezed from a little bag at the root, on the slightest pressure."

"But, mamma, sometimes when I have seized hold of a stinging-nettle very firmly, it has not stung me at all; how is that?"

"Because you have exerted force enough to close the little poison-bags, instead of opening them. The stings of insects also present marvelous varieties in the microscope."

"Do they? such little mites! We can hardly see the sting of a bee; yet it pricks sadly too."

"Moreover, it is so barbed that it is often left in the wound. Other insects have triple-forked stings."

"O dear! I shall take care of such stings, then. There is a bee now rubbing his legs."

"He is kneading up the materials he has

brought home in little hollow places in the joints of his hind legs. The sponge-like apparatus of bees and flies' feet enabling them to walk on glass, and on the smooth ceiling, is very curious."



HIND LEG OF A BEE.

"Do such little insects have teeth, mamma? they must be too small to be seen without a microscope."

"Many small animals have beautiful little teeth. Those of snails and leeches resemble fine needle-points."

"I remember the prick of the leeches' teeth, when I was ill."

"Numbers of these tiny animalcules inhabit shells as curiously constructed as larger ones."

"I like little shells very much, mamma. You know I found some on the beach at Margate, which we can only see by laying

them on something black; and yet, when I look close, they seem prettier than all the others."

"We are indebted to the labors of insects too small for examination by the naked eye, for some of our most beautiful ornaments."

"What do you mean, mamma?"

"Your sister's coral is the work of tiny worms."



CORAL.

"O mamma! I thought coral grew, like sea-weed, at the bottom of the sea."

"No indeed, Alexander; its increase in size is owing to the successive generations of insects, who each build new habitations for themselves on the top of their dead parents' houses, till they become what are called coral reefs."

"I have often heard of coral reefs, but I had no idea that insects made them."

"These reefs are the foundation of many islands, which in time enlarge, and become clothed with verdure; such as the South Sea Islands you read of in the 'Missionary Enterprises.'"

"That is wonderful, mamma."

"You will perhaps be still more surprised, when I tell you that a great many of our English public buildings are constructed of stone made of the discarded shells of animalcules."

"Can that be true, dear mamma?"

"It is indeed. Many of the handsomest churches at Oxford and Cambridge, and several other places, are built of stone which the microscope shows to be composed entirely of minute shells and corallines."

"Only think of such tiny creatures making the materials for our large churches and colleges!"

"There is an ancient saying, that 'all chalk is made by worms;' and this, though long doubted, is now ascertained to be literally correct."

"How, dear mamma?"

"Because chalk consists of these empty shells of animalcules; so that on visiting-cards and glazed paper-hangings—which are not glazed by white lead alone—you may

perceive, with a magnifying-glass, a most beautiful mosaic-work of perfect little shells."

"I should like to look at your shining cards through a microscope, mamma."

"Even the glasses we drink from, and the beautiful lustres on the chimney-piece, with all the various elegant articles made of glass, owe their existence in the first place to the labors of these industrious animalcules."

"Pray explain that, mamma."

"It seems that all flint was once the covering of some tiny insects; and glass, you know, is formed of flint. Agates and cornelians, too, have the same origin; and the polishing slate of Bilni, in Prussia, is so entirely composed of the flinty shields of very minute insects, that one cubic inch of the stone contains four thousand millions of distinct shapes."

"How very useful, then, these little creatures are to us, mamma!"

"Indeed it seems quite true, as a great writer asserts, that 'though inferior in energy to lions and elephants, in their united influence they are far more important than those animals.'"

"Are there as many curious tiny vegetables, mamma?"

"Every fresh investigation reveals new beauties in vegetation, my dear; whether

we examine the tiny plants we call yeast and mold—mosses, lichens, and fungi—or different parts of larger plants."

"I suppose the smallest plant has all its different parts."

"Yes; and all are as beautifully and perfectly adapted to their purpose, as the organs of our oaks, or the gigantic Talipot palm tribes. The florets of a daisy are as perfect as those of a sunflower."

"Ah, you have often shown me the tiny florets of daisies and clover in your botanical glass; and they are very, very pretty."

"Then the arrangements for conveying sap to every part of plants are shown by the microscope; and consist of exquisitely formed veins, spreading like the most delicate network over each surface of the leaves, and winding through the stems in the most orderly manner."

"Are not the sap-vessels alike in all plants?"

"O, no; there is as much diversity as in the veins of insects' wings. When I saw thin slices from the stems of different trees and plants through the microscope, I was astonished at the variety they exhibited; and each so regular, they looked like patterns of fine weaving, or delicate lace. Thin slices of leaf showed a similar variety."

"Mamma, perhaps those little insects

that only live a few days do not feel their time so very short, after all, as we think it."

"Most probably not, my dear. You see they prepare their homes, provide for their families, and perform the whole business of life in that brief interval; and therefore have doubtless fulfilled the purpose for which they were created."

"And I suppose, too, their drop of water seems a world quite large enough for them."

"Surely: we judge of all things by comparison, you know; and their small faculties would not appreciate the advantage of larger space or longer lives.

*Seems to them, that gleam of time
A century—that airy space
A universe: that looks sublime,
That both its grandness, use, and grace."*

"Poor little creatures, mamma; how soon all is over, and there is an end of them! They need not be vexed about their little momentary troubles, if they have any."

"And those blessed intelligences, my dear boy, who from their heavenly homes may perhaps gaze on our proceedings, might say the same of us; for, compared to eternity, how fleeting a moment is the longest human life!"

"Well, mamma, I will try and remember how very short our life is in the sight of God."

"Our life on earth you mean, my dear Alexander; for you know the Scriptures tell

us that the soul lives forever: and therefore 'if this is the only time for preparing for the long season of eternity, how diligently should we improve our opportunity of seeking Jesus, that we may, by believing in him and loving him, lay up for ourselves treasures in heaven. Lord, 'so teach us to number our days, that we may apply our hearts unto wisdom.'"

CHAPTER XI.

PLEASANT SIGHTS; OR, NATURE'S COLORS.

SUMMER time came, and Alexander accompanied his mamma on a long journey to a distant county. He had traveled more than many little boys of his age, yet was always delighted with fresh scenes; and greatly enjoyed some excursions to visit ancient castles and modern palaces, where primitive simplicity and refined luxury were sometimes rather curiously contrasted.

One beautiful day was devoted to the inspection of a splendid collection of valuable paintings, which decorated the rich state-apartments of a nobleman's seat. Alexander did not understand all their beauties; so while his mamma and her friends were ad-

miring the excellences of the great masters, whose celebrity and works had survived their own fleeting lives, he wandered quietly up and down, examining the furniture and brilliant ornaments of the suites of rooms through which they were conducted. Some were glittering with amber, satin, and gold; in others crimson was the predominant hue: blue damask, or green velvet, or white brocade, with flowers of all colors exquisitely embroidered, in the brightest shades.

At last the little boy's head and eyes ached; and he was not sorry when his mamma called him, and announced that their party was going to view the park and conservatories. Here he was refreshed by the works of nature, and roamed through the green-houses, admiring the rare exotics of which he had read; and was interested with seeing the tea and coffee plants, sugar-cane, tobacco, orange, and lemon trees, and many spice and fruit shrubs, whose productions and use in common life were quite familiar to him.

An aviary too, and fish-pond, with gay inhabitants from all quarters of the globe, excited his attention.

"How pleasant it is to get out of doors again, mamma!" he remarked, as, taking Mrs. M——'s hand, he bounded over the smooth lawn.

"Why, my dear, were you too warm in the house?" asked Mrs. M——.

"O, no, mamma; but my head ached, and my eyes felt so hot that I could hardly bear to use them."

"Were you looking so very earnestly at the pictures, then?"

"No, mamma. I liked them very much; but I could only understand a few of them. So I looked at the pretty tables and chairs, and the gay carpets and curtains."

"Well, I am glad you were amused with them."

"But, mamma, I want to know why I was so tired with seeing them; for you know, *pretty things are much more amusing than dull ones.*"

"Perhaps it was the brilliant colors of the hangings in the rooms that did not suit your eyes."

"How could that be, mamma? my eyes are just like yours, I believe."

"If they are like mine, and most other people's, my dear boy, some colors suit them much better than others."

"How strange, mamma! I never heard such a thing before."

"That is very likely; but just try and recollect your own feelings in the palace. Which room was most agreeable to your sight?"

"Let me think, dear mamma—that large drawing-room with amber satin on the walls was the brightest and grandest, I think."

"True; but just think which you should feel most pleasant to spend a day in."

"The crimson?" resumed Alexander, musing. "O, no! that made my eyes feel quite burning in a very little while. I think, mamma, the rooms with most blue or green in them were the pleasantest; for when I went into them, away from the others, it seemed quite a rest, and my headache almost went away."

"I do not wonder at this, my dear; for the human eye is so constructed as to be easily fatigued with strong glare, or very dazzling colors."

"This pretty green grass does not tire my eyes at all, mamma."

"No; it has often been remarked, as another proof of God's power and wisdom, that nature's colors are just those which are best adapted to the pleasure and refreshment of our eyes."

"I have never noticed that."

"Have you not, Alexander? I think you have, without knowing it. Did you not remark just now how pleasant the green hue of the grass was?"

"To be sure; and so the soft blue sky never makes my eyes ache."

"Just so; and the exquisite tints of the flowers are so adjusted as to present no violent or unpleasing contrasts."

"I have often thought how very prettily the flowers are colored, especially when two or three different colors are on the same flower; they are put together so very nicely, that each looks better than if it were alone."



"Exactly: the purple and yellow of the hearts-ease, for instance; the beautiful dark pencilings on the brilliant petals of gera-

niums; the elegant painting of a tulip, or the sweet delicate tints of the rose."

"Then the pretty green leaves shading them, mamma, make them look all the better, I think; for a plant all pink, or all blue, would not look half so nice."

"True; and where one color alone is the chief, none is so grateful to the eye as green."

"We never see a whole field full of other color, do we, mamma?"

"O yes; in traveling, you know, we have often remarked fields of red cabbages; others of scarlet poppies, yellow buttercups and cowslips, purple thyme, white chamomile, and blue flax."

"So we have; and the blue flax looked the prettiest. The other fields looked curious, but they made my eyes tired sooner than the pale color of the flax."

"What a blessing it is for us, then, my dear boy, that God has made the sky blue, instead of scarlet or orange-color."

"O mamma! a scarlet sky would be painful. Even the bright colors from the setting sun I cannot bear to watch long; and that night the sky was so red, from the reflection of a fire, I thought it looked quite terrible."

"Well, what do you think of an orange-colored sky?"

"It would not suit me at all, mamma, if it made my eyes feel as that amber-colored room at the palace did."

"Have you ever noticed the effect of much white in a landscape—chalk cliffs by the sea-shore, for example?"

"The chalk cliffs at Dover used to be very dazzling; but perhaps that had something to do with the chalk itself, and was not the effect of color alone."

"Snow, then, you may think of."

"Snow glitters very much in sunshine, mamma; and glittering, I think, makes one's eyes ache very soon."

"True; but snow at dusk, or in a cloudy day, does not glitter."

"Well, mamma, I cannot tell how it would suit us: do you know?"

"As snow does not lie on the ground very long in this country, I can only judge from the reports of other people, my dear; and I remember Sir John Ross and other travelers mention how frequently they suffered from snow blindness, when residing in the polar regions."

"Did snow blindness come from the white color, mamma?"

"Partly; but it was also greatly increased by the sun shining. Even daylight with a cloudy sky rendered the snow so very dazzling, that they found it dangerous to travel

and expose their eyes to its influence; and therefore were continually obliged to rest during the day, and pursue their journey at night.

"I wonder how black would suit our eyes, mamma?"

"If you ask those dressmakers who are much employed in preparing mourning dresses, they will tell you how much suffering it costs them."

"Indeed, mamma! Do you feel that when you are busy with black work?"

"Yes; so much so that I am glad to put such work aside for very bright daylight. Did you not complain too of your eyes aching, when you were so intent upon painting the hull of your ship black?"

"I could not look at it long, I remember. We do not often see black, or even very dark flowers."

"No; and when the blossom is dark, it is usually relieved by light-green leaves. But what an awful effect is produced upon country scenery, by the black clouds which sometimes betoken an approaching thunder-storm!"

"And at night too, mamma, when there is neither moon nor stars, it seems very gloomy and dismal."

"True: our eyes are adapted for use in light, though the darkness is grateful when

the labors of the day are over, and we need rest. Most persons sleep more soundly in darkness than when burning a light, or in summer twilight."

"We cannot bear to look at the sun, mamma; so I suppose our eyes are not made for such a strong light as that."

"No, it is too brilliant for us, and even for birds. The light of the distant stars, when observed through very powerful telescopes, has been found quite overwhelming."

"I remember you told me how Sir William Herschel was dazzled with Sirius. But, mamma, eagles seem able to bear sunlight."

"Their eyes are differently formed from ours. Some birds, as the secretary-bird,



EYE OF THE SECRETARY-BIRD, WITH THE HEMISPHERE, OR CURTAIN, PARTLY DRAWN.

have a kind of curtain, which they can draw over the eye when exposed to the glare of the sun's rays. Then, again, owls and bats shrink from the daylight, which is agreeable

TO US. Cats seem to possess the faculty of seeing through deep gloom; and doubtless insects whose habits lead them to live in obscurity, can see as much as they need for convenience and safety."

"Mamma, do you remember telling me how difficult it was for people to breathe at the top of high mountains? Is it difficult to see there?"

"Travelers have experienced a great difference in their power of vision, my dear. The first persons who ventured up Mont Blanc became totally blind for some days afterwards."

"How was that?"

"They attribute it to various causes. The dazzling effect of the snow was one reason; then the piercing wind seemed to dry up the natural moisture which God has provided to keep the eye in a state fit for use; besides the thin atmosphere, which rendered every object painfully vivid and distinct."

"Did they recover from their blindness?"

"After a time they did; but their sight was long weak and delicate. Now travelers are careful to guard their eyes by glasses and veils, before ascending mountain heights."

"It is as puzzling and painful to look at very small objects, mamma, as to look at some colors, I think."

"Certainly; we continually feel the limits of our faculties, my dear boy, even while we admire and marvel at their perfect adaptation to our wants and condition."

"Just now, when we were in the museum of the mansion, I could not see those tiny, tiny insects and shells without the magnifying glass; and then it made my head ache to use that long."

"The same effect is felt in using the telescope long at one time, my dear, or in straining the eye to catch a view of objects that are too distant."

"But I can see things that are much farther off than you can distinguish."

"Every one has what is called a natural focus to the eye, my dear; that is, an exact distance at which they can see objects most clearly; and this focus differs in different persons. When you try to look through my glass, does it help you?"

"No, mamma; I can see much better without it."

"So when I look through a telescope," continued Mrs. M—, "I am obliged to alter the situation of the glass lenses. The same arrangement does not suit me, that suits you and your papa."

"How curious that is!"

"Curious and useful too, Alexander; for different individuals are thus fitted for their

various pursuits. Some can investigate the more grand and distant works of creation; others may examine those minute creatures which need close inspection. You know, I can see very fine threads, or small print, much better than you can, when placed very near my eyes; and I do not feel half so tired in reading a little book near the eye, as I do in reading much larger print at some distance for a much shorter time."

"How is it that grandmamma cannot see without spectacles? and she is so glad to rest her eyes at dusk in the evening?"

"As people grow older, their eyes alter. Some can see better than in youth, and others do not see so well; but you could hardly understand the reason of this, if I tried to explain it to you. Hark! uncle R—— is calling us to see the aviary."

Alexander and his mamma had been resting in a green arbor during the above conversation; while the rest of the party had ascended a lofty tower to gaze on the landscape around. Mrs. M——'s short sight unfitted her for this enjoyment, and Alexander's headache disposed him to prefer waiting with his mamma. Now, however, he started up quite refreshed, and ready to observe and admire the rare foreign birds forming the magnificent collection. He particularly noticed the elegant crests which

adorned the heads of many, the tippets and ruffs which covered the necks of others, as well as the varied plumage his mamma's previous conversations had described to him.

"O, what beautiful creatures!" he exclaimed, as he looked at some Chinese pheasants, and American parrots, and humming-birds in gay attire. "Here are colors enough, I am sure."

"Just observe too, my dear boy, how judiciously they are selected, and shaded from one to another, or contrasted with the most exquisite taste."

"The little birds are the brightest and gayest, I think."

"That seems in harmony with what we have noticed before of God's wise arrangements among his creatures: a great deal of bright color would fatigue the sight, while a little is enlivening. We never hear of a scarlet elephant, or an orange-colored lion."

"O, no! their own proper colors look much better for them."

"True; and, moreover, are better suited to screen them from the observation of their foes than more brilliant coats."

"But, mamma, I have seen a very large white bear."

"Do you remember where he came from?"



THE POLAR BEAR.

"I think he was called the polar bear; & I suppose he came from the north pole."

"He did; and for that very reason wor:

his shaggy white dress, which would enable him to glide over the snow in search of his prey without being very easily seen."

"Mamma, is that really the case?"

"Yes; it is remarked by naturalists, as a proof of the goodness and wisdom of God, how frequently the color of an animal is thus made its safeguard."

"Indeed, mamma! how?"

"Our partridges and common hens, for instance, are usually of so dusky a hue, that, when crouched on the ground, kites and eagles on the wing can scarcely notice them sufficiently to descend with a true aim on their prey."

"But if they move, mamma, would not birds of prey see them then?"

"Of course; but God has given them an instinct which warns them of the approach of these enemies: and you may observe them in the farm-yard keeping motionless till the danger is past."

"I have seen that, mamma, but I fancied that was to deceive the birds with pretending to be dead."

"The mere fact of death would not be sufficient, I believe, to deprive a hungry kite of so good a meal; but the fowl's practice is now ascertained to be for the purpose of escaping notice entirely."

"That is very wonderful, mamma. Then

perhaps that is the reason so many little birds have brown or dull feathers, almost like the trunks of trees."

"It is very probable, my dear; you yourself frequently complain that the snails in your garden escape your eyes, because their shells are so like knots in the wood."

"Indeed they do. I often wish they were as gray as the hedge-snails I find in the fields."

"They, too, so often resemble the hues of the flowers under which they shelter, that we do not notice them without search."

"Ah, and the little green caterpillars, and insects which eat up my roses so sadly; I can hardly find them out, for they are so exactly the color of leaves and stems of the rose-bushes."

"In tropical regions many persons are beguiled into danger, by picking up what appears to be a little crooked stick, or sitting down on what looks like the branch of a tree."

"What sort of danger, mamma?"

"Only the other day I was reading of a lady in Australia, who picked up a twig, as she thought, covered with a beautiful moss: it proved to be a tiny snake, called the carpet-snake, from this bright variegated appearance, but a very venomous reptile."

"Did it bite her?"

"No, happily it wriggled out of her grasp; and the gardener, who saw in a moment what it was, killed it with his spade."

"But the log of a tree, mamma; what could that be?"

"Large serpents, such as the boa-constrictor and rattle-snake, have been thus mistaken, till their movements have betrayed them to the frightened traveler. Alligators have been mistaken in the same manner, and have often thus secured their prey."

"I should be disposed to shoot the alligator first, mamma."

"No doubt you would, my dear, were it not that this dusky color prevents people thinking of him. Some animals possess the power of changing their hue, as they move among different objects."

"That is still more curious. What animal does that?"

"The chameleon is perpetually varying in color when in motion; and when at rest looks so like the foliage under which it shelters, that we might easily overlook it."

"Well, mamma, now I know how useful these dull colors are to the animals who wear them, I shall admire them more than I used to do."

"Moreover, all animals who live in snowy regions are observed to change their color in winter time, when they are universally

clothed in white ; so that Sir John Ross and his companions used to judge of the approaching severity of the season, by observing the time when the foxes and bears put on their white dresses."

"Then if people want to catch animals with white fur, I suppose they hunt them in the winter time."

"Certainly. The ermine and white fox collected in winter are much more highly esteemed, on account of their delicate snowy fur: the sable, on the contrary, becomes so pale then, that its fur looks less handsome than in the rich brown hue of its summer attire."

"And do the polar birds change the color of their feathers too?"

"Yes, those few who spend the winter there do ; such as the snow-bunting, with a few partridges."

"I wonder whether those beautiful humming-birds and pheasants would lose their bright colors, if they lived among ice and snow."

"They are not adapted in other respects to endure a cold climate ; and in England require great care. It is often observed, that both animals and flowers lose their peculiar brilliancy, when removed from their native regions."

"Then we cannot see foreign creatures in perfection here, I suppose."

"No; we are told that the peacocks and canaries of England are very inferior to their brethren in their original homes. Indeed this may account for the white peacock being more common here than in other countries.

"But if they are taken prisoners there, and stuffed and brought home, do we not see their bright colors exactly then?"

"I believe not; for their beauty depends much on life, as each feather, I told you, derives nutriment from the animal, which ceases when it is once detached. And flowers, you know, invariably fade and lose nearly all their color when gathered."

"O yes; I never can keep the colors of any I dry and press: even those kept in water soon wither away. It seems a pity such beautiful painting lasts such a very little while, scarcely long enough to copy it in a picture."

"If it took God as long to paint each flower, or each feather, as it does for us poor mortals to attempt an imitation of his beautiful handy-work, we should miss all the gayety of creation, I fancy."

"Why, mamma, the seasons would not last long enough to color the plants, much less the animals and insects."

"And yet what a profusion of ornament we see everywhere; besides all the splendid

colors of shells and minerals, which are but seldom, if ever, seen in their native beds."

"O mamma, how very beautiful the inside of mussels are! so exquisitely shaded."

"Then we must not omit the tempting colors of fruit, or the becoming tints of the human frame—that soft blending of red and white on your sister's rosy cheeks."

"She looks much prettier with her bright red lips and blue eyes, too, than if they had no color."

"The very tint of the arm and hand, as it changes from the mottled hue of infancy, to the fair bloom of youth and maturity, is an exquisite combination, which artists find it difficult to represent."

"Do you think copper-colored and black people look pretty, mamma?"

"I have seen handsome countenances wearing both those colors, my dear; and no doubt we should, if better used to it, see as much beauty in their skins as in our own; while I believe the pigment, or thin coating under the skin producing the color, is a most merciful alleviation to the heat of their climates. They regard white persons as diseased, or at any rate very defective in their organization."

"Mamma, I wonder why the Bible always describes the angels as clothed in white robes?"

"Most likely as emblematical of their purity, white being thus used among all nations. When it is said of human beings that they 'washed their robes, and made them white in the blood of the Lamb,' it is evidently a figurative expression intended to imply the justification and cleansing of believers in Christ, by his atoning blood and righteousness, through faith in him. May you, my beloved Alexander, be among that *happy throng, who, thus arrayed, shall stand in the last day 'faultless' before the throne of God!*"

CHAPTER XII.

BEASTS OF PREY; OR, NATURE'S BALANCE.

"O, how these gnats do sting me, mamma!" exclaimed poor Alexander, one warm summer evening; "I cannot think what gnats are made for."

"Nay, my dear, just look at that spider's web," replied Mrs. M——, pointing to the hedge; "there is evidence that spiders find gnats good for food. It was only yesterday, my dear boy, that you were pitying a poor gnat which was entangled by a web, and you called the spider cruel and greedy, for eating the dinner his instinct prompted."



"I forgot then the stings that guats have, mamma; so now the spider is welcome to all he can catch. But only look what numbers there are! I am afraid all the spiders together could not eat up so many."

"It is happy for other creatures that such small insects are so numerous, as they form the principal food of many birds."

"Indeed, mamma! I always thought that birds ate seeds, or fruits. Grandmamma's canary never has anything else, or the parrot either, except a lump of sugar for a great treat."

"The soft-billed birds, such as swallows, martins, and wrens, feed entirely upon insects. In fact, there is a numerous tribe named fly-catchers, from their dexterity in destroying these tiny creatures. You may

easily distinguish this class of birds by their movements, as they skim up and down, pursuing their airy prey, and snapping their bills in a quick, jerking manner as they capture some unwary being."

"They must be very clever to catch gnats, I think."

"The gray and pied fly-catchers are provided with little hair-like bristles at the base of the bill, which assist in securing their prisoners; and they may be seen perched upon some rail or gate, for hours, now and then darting off to pursue their prey, and then returning again to their post with unwearied diligence."

"But a single gnat is such a very small morsel, mamma; not one mouthful, I should think, even for a little wren."

"However, the birds make up for that by the immense number they devour."

"Do the young birds in the nests eat insects too, mamma?"

"Yes; and hard work it must be for the parents to supply their craving appetites. If you were to watch a single pair of starlings, or swallows, feeding their broods, you would be astonished at the incessant labor they seem to undergo."

"How often do the parents feed them?"

"One observer states, that some young nestlings he watched were each indulged

with eight-and-twenty portions of food or water; and, as there were five in number, the old birds could not have traveled less than fifty miles during the day to procure it."

"Poor little creatures! they did work hard indeed."

"Those who feed their young on fish, often undergo great fatigue. The pelican—a large bird, it is true—often carries home, in the loose pouch under her neck, fish enough to dine sixty hungry men."

"Then, I suppose, young pelicans require as many fishes as smaller birds want of insects."

"Perhaps so. Swallows and woodpeckers will venture upon bees; and often play about the hives, keeping watch at the entrance, and pouncing upon any quiet workers, as they stop to brush themselves before they go in."

"I have seen swallows do that, and robins too, I think."

"They are nothing loath to share the spoil, I dare say, Alexander; though robins feed chiefly upon worms and caterpillars—following the gardener's spade, and sure to discover any newly-turned earth."

"Do not rooks eat the young corn, mamma? Because Mr. H—— is always so glad to have the rooks on his farm shot."

"Naturalists tell us that this accusation is a libel upon them, and that rooks and crows are, in reality, extremely serviceable in demolishing certain grubs which attack the roots of plants."

"I have often noticed them on meadow lands, where cattle were feeding."

"There they are seeking for a grub which feasts upon the roots of a turfy hair-grass, which graziers greatly disapprove of for pasture. The grub injures the root, and the rooks finish the business by drawing up the plant to eat the grub; and have thus been known quite to eradicate this obnoxious grass."

"But, mamma, how do the rooks find out these creatures buried down in the earth?"

"That is still more wonderful, my dear; and is supposed to be from their acute sense of smelling, as, when flying high in the air, they will pounce down upon the exact spot where these grubs most abound."

"Well, I think if Mr. H—— knew all this, he would let the rooks stay on his farm, instead of shooting them."

"Ah, but Mr. H—— grows potatoes, you know; and here, it must be confessed, rooks are sad thieves, digging out the new settings: so that it is not surprising to find farmers anxious, here and there, to hang up a rook as a warning to the race."

"How many little boys seem busy as scare-crows in the spring!"

"And yet, I believe, the crows very seldom interfere with the corn. They are more intent upon insect prey, or those grubs and larvae which would become insects if left long enough to mature. However, they have gained a bad name from common prejudice; and the term of scarecrow is used still, while the little watchmen are really only needed for one or two lesser birds, who, in seasons of insect scarcity, do certainly steal the food set apart for man."

"One day, mamma, I saw some crows pecking the poor sheep, and I wondered they did not drive them away."

"The poor sheep were no doubt very thankful to the crows, who were seeking the insects which nestle in their thick wool, and torment them terribly. Do you not remember the little ducks I showed you last evening, performing the same welcome office to a cow?"

"O yes; she was standing in the water with her poor legs covered with flies, and the ducks were swimming round and round, and pecking them off with their large beaks; and the cow stood quite still, looking down as though she really quite enjoyed it."

"No doubt she was greatly relieved by the little ducks' efforts."

"Uncle R——'s tame duck seemed very fond of snails."

"Snails are a favorite food with many birds. Some swallow them whole, shells and all; others display great ingenuity in breaking them, and picking out the snail."

"How can they break the shell?"

"Some have beaks hard and sharp enough for the purpose, and some birds drop them upon stones from a great height. But no animal seems at a loss to procure its appropriate food; if one expedient fails it will try another, and another, till it succeeds."

"Ah, I have often been surprised at the duck's perseverance when it has picked up a very long worm; in spite of its wriggling, he always swallows it at last."

"True; and yet it is so melancholy to watch the poor little captives, that I am always glad to send pussy away when she has caught a mouse."

"Puss eats birds too, mamma. You know she stole poor Helen's canary a few days ago, just in that little time the parlor door was left open."

"Mice are the favorite food of owls; while hawks and kites make sad havoc with small birds."

"Foxes, too, run away with geese and chickens, do they not?"



HEAD OF THE RAVEN.

"Yes: they also destroy sheep. Eagles and vultures, too, are enemies of our flocks."

"How do vultures and eagles get sheep into their nests? for they build on such high rocks."

"They carry them in their powerful talons, my dear: indeed, they have been known to carry off little children."

"What, to eat them?"

"It is to be feared some have been devoured; but there are many interesting facts recorded of such little creatures being recovered again, and found unhurt. Even ravens will attack young lambs."

"Not to carry them up into their nests, surely?"

"No; but to peck out their eyes, which are always the parts they select: but their own power is so feeble, that they seldom attack any but the dead, or dying."

"I remember a raven pecked out that poor old toad's eyes."

"I have read, too," resumed Mrs. M——, "that in savage nations, where human sacrifices are unhappily yet common, many birds are found feasting upon the horrid remains of heathen cruelty."

"Lions and tigers eat people, do they not, mamma?"

"They are not supposed to prefer human beings to other food, my dear; as they attack buffaloes, goats, and sheep, and even the elephant and rhinoceros: any animal that promises a meal."

"It must be very dreadful to travel among those wild beasts."

"It is very remarkable that most of them only attack when hungry, and do not seem to exhibit any particular pleasure in the mere act of hunting and killing."

"Do you mean to say, mamma, that a lion would let me go by his den safely if he had just had his dinner?"

"Yes, provided his family had dined too, and you did not provoke him to anger; as otherwise he would very likely deem you a desirable morsel for his feast."

"Do lions and tigers love their little ones?"

"O yes; so much, that they will defend them to their last breath, and attack any creature to procure them food. It is singular that some savage beasts will not touch a dead body."

"How is that?"

"They appear to covet the warm blood. I have read of persons who had no other way of escape from them but by lying perfectly still, and holding their breath so as to counterfeit death, and with such success that their assailants have left them unhurt."

"Dear mamma, what animals will do that?"

"The lion, tiger, bear, and serpent."

"I suppose serpents always bite their prey to death."

"Some do, but the bos tribe coil round, and crush their poor victim's bones, so that it can be swallowed at leisure."

"How many animals seem to live upon

one another, mamma, as though there were constant warfare among them! It is rather shocking to think of so much bloodshed."

"And yet were it not for this arrangement, my dear Alexander, which it has pleased the Most High himself to ordain, we should speedily be overrun with the brute creation, as they multiply so very fast, and arrive at maturity generally much more quickly than man."

"That would never do, mamma."

"God, you know, gave the beasts to us for service and for food; and he taught each animal to select its prey, and moreover instructed it how to take its life in a speedy, and comparatively easy manner."

"Do not cats tease mice very much?"

"They do, certainly; but when once wounded, pussy kills them directly. I have never read or heard of any animal devouring its prey piecemeal, without putting it to death first."

"Then, mamma, if my little church history is true, people are much more cruel to each other, when they persecute martyrs, than even savage beasts."

"I am sorry to say, Alexander, that this is a melancholy fact. When man abuses his reasoning powers for that purpose, he becomes ingenious in torturing, as well as in everything else."

"Still, mamma, now you have told me how perfectly every tiny insect is formed, I cannot bear to think of all these creatures eating one another. Does it not seem a great pity that they should not enjoy life till they die of old age?"

"We cannot doubt the wisdom of the great Creator's arrangements, my dear boy. But a little reflection will show you that they have as much happiness, perhaps, as they are capable of enjoying."

"What, when they are eaten up so soon?"

"To begin with the lowest grades of existence. The larvae of insects, or eggs of birds, you know, possess no feeling, and suffer nothing; while there is such an immense quantity, that, if all came to maturity, they would lack food, and die of starvation."

"To be starved, certainly, would be a slower and sadder way of dying."

"Then those who arrive at maturity would soon die, according to the natural law. Insects especially are only formed for short lives, and would die from the damps of night or the cold of winter."

"Ah, then, perhaps they would only be miserable, mamma, if birds did not eat them."

"Larger animals, when left to grow old,

seem to lose all power of enjoyment, and even of procuring food."

"Why can they not get food?"

"Those who have to exercise agility in springing upon and pursuing their prey, become less active: their teeth also get blunt, and unfit for mastication."

"Would not animals feed one another in such cases?"

"Very few brutes show any compassion to their sick or infirm companions. Do you not remember our poor little gold-fish which was bruised—how the others tormented it?"

"Yes: you took it away for some time; but, after all, they pecked and teased it to death, as soon as you put it back again into the same fish-globe."

"Just so. Many animals will devour even their own young ones; especially if they are very hungry."

"How very shocking! But did God really mean animals to prey upon one another?"

"Anatomists tell us, my dear, that the teeth of a great many are evidently formed expressly for feeding upon flesh; those of the lion, tiger, fox, and similar ravenous creatures."

"But would not the same teeth do equally well for grass?"

"Not equally well, assuredly. Besides, farther examination of animal organs proves that these teeth always accompany powers of digestion suited for animal food; while the teeth formed for grazing are joined with organs suited for turning vegetables into nutriment."

"That is very wonderful, mamma."

"Moreover, these beasts and birds of prey are also provided with instruments wherewith to catch and kill the creatures upon which they feed. Thus, those birds who prefer a fish diet have their claws notched inside, so as to hold fast their slippery victims. The woodpecker and chameleon possess tongues remarkably fitted for the capture of their insect food."

"Do elephants eat flesh, mamma?"

"No, my dear; they prefer vegetable food. Indeed, most of the larger animals now known select this innocent sort of diet: a merciful provision, as the temper and disposition of brutes seem materially influenced by the sort of food they live on."

"Do they, mamma?"

"It is generally stated by the keepers of menageries, that a full meal of flesh excites ravenous beasts so greatly, that they dare not permit them to kill for themselves. Even our domestic horses and cats evince more spirit after some kinds of food."

I wonder whether animals dread their enemies."

"Their natural instinct always prompts an effort to escape."

"Is that because they are afraid of death?"

"They can have no distinct notion of death, my dear; though it is said that the poor sheep and bullocks which are led to the slaughter-house will shrink back, as if aware of some impending evil."

"Perhaps they may see some remains of other sheep or bullocks there."

"Possibly; but God said to Noah, that the fear and dread of man would rest upon every animal: and to this day it is continually displayed."

"I should like to know, mamma, whether animals used to eat one another before the flood."

"It seems most likely that they did, as the remains of some of the antediluvian creatures not only exhibit teeth fitted to bite animal food, but claws well suited to catch and kill their prey: while the half-digested bones and scales found within their skeletons, and scattered around, seem to yield indisputable evidences of the fact."

"O, that reminds me of one question which I meant to ask. Do all these creatures always swallow the hair or feathers of their food?"

"When swallowed, those parts which will not digest are afterwards thrown up in small pellets. Little balls of hair, and insects' scales, may often be found near, and thus betray the nests and lairs of birds and beasts of prey."

"But, mamma, there seems no excuse for man killing animals to eat, I think."

"Why, my dear, we are quite sure we do right so to use them, because of God's own precepts to Noah, besides the still more particular directions to the Israelites at the time of the Jewish ritual being appointed; but if people did not eat sheep and bullocks, both brutes and men would soon be in danger of starving."

"How, mamma?"

"Just reflect how utterly impossible it would be to supply pasture and vegetable food enough even for the animals we now consume; and if these were suffered to live, and increase according to their natural propensities, the earth would be speedily overrun with them; and then, rather than die of hunger, they would doubtless change their habits, and devour one another, or even perhaps turn upon and attack man."

"I never thought of that. Well, it is best that things should be as they are, I should suppose."

"Undoubtedly, my dear; as all is under

God's control and wisdom. He has made all the beasts; and when the lion and the young ravens cry unto him for food, he has instructed them how to go forth and seek their prey."

"There seem to be more tiny insects than large animals, mamma. What swarms of gnats there are flying about now; and every ant-hill shows thousands and thousands of ants!"

"Naturalists inform us that there is a correspondence, or balance, in every part of nature. These very small insects, which increase by myriads in a summer, are usually short-lived, as well as furnishing food to a great variety of larger creatures. In studying the habits of larger animals, they find there are fewer young in a family in proportion as the parents are more formidable to each other, and requiring a greater supply of food. Dr. Paley remarks: 'An elephant produces but one calf; a butterfly lays six hundred eggs. Birds of prey seldom produce more than two eggs; the sparrow and duck tribe frequently sit upon a dozen. In the rivers, we meet with a thousand minnows for one pike; in the sea, a million of herrings for a single shark.'"

"That is very wonderful. But there always seems plenty of food that man can eat."

"It has been mentioned, as another proof of God's wise benevolence, that while animals are restricted, by the construction of their teeth and digestive powers, to certain kinds of food, man can live upon all sorts."

"Can he, mamma? what, upon serpents and crocodiles?"

"Yes, from grasshoppers and locusts, to whales and reptiles; fish, flesh, and fowl, either raw or cooked; roots, leaves, and fruits: any that are not absolutely poisonous have been found capable of sustaining life; though some are much more wholesome and nourishing than others."

"Mamma, do animals have any life beyond this?"

"The Scriptures give us no reason to suppose they have, my dear."

"Then does it not seem wonderful, that so much contrivance for their clothing and all their wants should only last such a little time?"

"While we observe this, my dear boy, our admiration should be increased of the boundless resources and benevolence of the great Creator, who bestows so much pains and so much ornament upon creatures of such limited existence."

"God seems to have made even the shell-fish and worms, which are not pretty, as usefully and wonderfully as peacocks and lions."

"God does not work to be seen of men, my dear: all his works are thoroughly done, and adapted so entirely to their respective purposes, that we can hardly imagine any other contrivances could have answered better."

"Well, mamma, I will always try, by God's help, to do all my duties in the very best manner."

"Try too, my dear Alexander, to regulate your conduct by the recollection that God's eye is ever upon you. And if you really trust in and love that Saviour who died to redeem you from sin, you will always be careful to prove that love by keeping his commandments, as well as praising him for all his wonderful works."

PRAlSE FOR CREATION AND PROVIDENCE.

I see the almighty power of God,
That made the mountains rise;
That spread the flowing seas abroad,
And built the lofty skies.

I sing the wisdom that ordain'd
The sun to rule the day;
The moon shines full at his command,
And all the stars obey.

I sing the goodness of the Lord,
That fill'd the earth with food:
He firm'd the creatures with his word,
And thus pronounced them good.

Lord, how thy wonders are display'd
 Where'er I turn mine eye,
 If I survey the ground I tread,
 Or gaze upon the sky?

There's not a plant or flower below
 But makes thy glories known;
 And clouds arise, and tempests blow,
 By order from thy throne.

Crustaceans (as numerous as they be)
 Are subject to thy care;
 There's not a place where we can see,
 But God is present there.

In heaven he shines with beams of love,
 With wrath in hell beneath;
 'Tis on his earth I stand or move,
 And 'tis his air I breathe.

His hand is my perpetual guard,
 He keeps me with his eye:
 Why should I then forget the Lord,
 Who is forever nigh?

THE END.

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