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UNDER THE WAVES:

OR, THE HERMIT-CRAB

“IN SOCIETY.”

BY ANNIE E. RIDLEY.

—“ In hollows of the tide-worn reef,
Left at low water glistening in the sun,
Pellucid pools, and rocks in miniature,
With their small fry of fishes, crusted shells,
Rich mosses, tree-like sea-weeds, sparkling pebbles,
Enchant the eye, and tempt the eager hand
To violate the fairy paradise.”

MONTGOMERY.

LONDON:

SAMPSON LOW, SON, AND MARSTON,

MILTON HOUSE, LUDGATE HILL.

1865.

PREFACE.

KNOWING well the suspicious looks with which our young friends regard all books professing to give “useful information in an entertaining form,” particularly when such books make a claim upon holiday-time, we think it as well to disown any such intention in this little volume, and to state frankly that our first object is to amuse our readers, by presenting some of the most curious facts, in the history of a few of the most common marine animals, in as simple a form as possible: facts in themselves so curious, that, if we fail in this object, the fault assuredly does not rest with our subject.

Having thus disarmed suspicion, it may be allowable to express the hope that, if the effort to amuse

should be successful, an interest will be awakened which must, of itself, lead to the desire for the instruction, which, in this as in every branch of Natural History, is so full of delight. It is to meet this desire that we would suggest a few of the works most likely to satisfy it, for it is not necessary to remind my readers that the view of society "Under the Waves" here presented to them is merely of the most superficial nature; so that, if they should be tempted to fancy, because their patience had extended to the last chapter, that they really knew anything about the subject, they would be as much mistaken as would be a visitor from a distant planet, who, on the strength of a few morning calls and an evening party or so, should return to his native orb, and profess to know all about the inhabitants of the earth. As he could know nothing truly of the men and women he had seen without following them into their own quiet, domestic life, so can you know nothing truly of the creatures here introduced to you, unless you carefully study their habits in their lives; this you may do either with your own eyes, or (in this more fortunate than our imaginary visitor) through the eyes of the many

patient and faithful students who have given us the records of their seeing.

Amongst the most interesting of these for the unscientific reader (and for the most scientific reader too!) will be found, first, Mr. Kingsley's "Glaucus," as an introduction, giving clearly and beautifully the full object and influences of the study of Natural History; then, all Mr. Gosse's delightful books, "The Ocean," "The Aquarium," "The Naturalist on the Shores of Devon," "Tenby," "A Year by the Shore," (published first in *Good Words* for 1864), and "Land and Sea." Mr. Lewes' "Seaside Studies," and Mr. Harper's "Glimpses of Ocean Life," are both entertaining and instructive; while, for books of seaside reference, to assist in the identification of the animals, there are many very good works. Mr. Wood's "Common Objects by the Seashore," a shilling book, is placed within every one's reach, and is very useful; it is more compressed than Professor Harvey's "Seaside Book," and Miss Pratt's "Things of the Sea-coast." As a strictly scientific book of reference, Mr. Gosse's "Manual of Marine Zoology" stands at the head of the list; but by the time you come to that you

will be quite within the charmed circle, and will need no guidance to lead you to the centre, where you will find, in innumerable valuable scientific works, more than enough to fill your soul with wonder and reverence.

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Under the Waves.

CHAPTER I.

IN a little valley lying low among the rocks, in deep water, though at no great distance from land, a very ancient-looking Hermit-Crab was slowly picking her way among the stones and sea-weeds which covered the sandy floor, when she encountered a younger Hermit, speeding hastily in the opposite direction, whom she thus accosted :—

“ Where are you going now ? You seem to be in a hurry ! But I suppose I need not ask you that, you are of course on your way upward, to gossip as usual with those idle new friends of yours, the Waves. I have my doubts about *them*. What do they ever do but roll uselessly here and there, or else rush in and out among the rocks on shore,

peeping and peering into every nook and cranny, to find something to make stories about? They are not to be trusted: and mark my words, if you take to their ways, you'll come to no good! Why can't you settle down contentedly in your native valley?"

"Now, don't be so cross, there's a dear old lady!" responded the other, good-naturedly. "If I wish to see something more of the world than can be seen here, there is surely no harm in that."

"See something more of the world! Where have you picked up that notion? Whoever before heard of a Hermit wanting to see the world? Did any of your ancestors ever talk of such a thing?" exclaimed the indignant old Hermitess. "Really I should have thought you had seen enough of the world to satisfy any one, in that unlucky adventure of yours which has made such a changed creature of you. To be dragged out of the water in a net mixed with all sorts of strange company, and hustled and shaken about without any respect:—to be seized by those terrific monsters—men, as they are called, of whom I have heard enough ill in my time—and then to be thrown like mere rubbish at the bottom of their boat! This would have been enough of the world for *me*, I know! But *you* have never been able to settle down at home since!"

“ Well, but you see it all came right in the end ; and the kindness shown me by the Waves, who so obligingly turned the boat over that I might escape, convinced me that one may miss a great deal of pleasant and profitable experience by living too exclusive a Hermit life. After the first shock was over, and I got used to the crowding and shaking—which certainly was uncomfortable—there was a great pleasure in the novelty and excitement, and in making so many new acquaintances ; especially that of the Waves and Sunbeams.”

“ An idle, giddy, frivolous set !” said the Hermitess, snappishly, “ you have never been like yourself since ; never at rest for a day, but always trying to get back to your new friends. And then, too, to think of your finding a way to the surface among the rocks ! Why large rocks were ever made, I can’t think ! If they are large enough to live under, that is as much as anybody needs !”

“ Ah, you should just come up with me !” said the younger Hermit, “ you would see things in quite a new light, and would soon put away some of your old prejudices.”

“ Oh, no doubt ; of course, your fine new friends know best ;” rejoined the elder, sarcastically. “ Of course, the customs and experience of a long line of Hermits go for nothing ; but,

mark me, you will repent taking up with these new ways."

"If you only knew how jolly it is among the waves! They are the merriest fellows imaginable; and they have *such* stories to tell of their travels," said the Hermit.

"I dare say they have; but it is not very likely, that, at my time of life, I am going to begin gadding about, and to listen to idle stories. I have always found enough to content me here, without running after strangers, and so should you. If you were young and giddy, I could understand it; but with your age and your sense, you ought to know better. If you will take my advice, you will marry and settle down respectably. But I suppose the next thing will be that you will wish to leave the deeps, where it has been your good fortune to be placed, and take to shallow water, as some Crabs are foolish enough to do!"

"Well, the fact of the matter is, that I am just on the point of trying that very change, although for a short time only. I think I have hitherto been really far too secluded in my habits, and so I have resolved to accept the invitation of the waves to go with them, and see a little of shore-life. I do not know how long I shall be away, but I will pay you a visit as soon as I return, and tell you my adventures."

Thus saying, and speaking very fast, to leave no room for any answer, the Hermit hurried away, and was out of sight before his old friend could recover from the shock she received from this confirmation of her worst fears. Not that there was the least occasion for such haste, but the wily Hermit, whose passion for travelling was a standing subject for disagreement between himself and his steady stay-at-home friends, had no desire to hear the lecture which he knew was certain to follow his announcement of his intentions. The old Hermitess, who, in spite of her snappishness, was not of a really bad disposition, felt most sincerely grieved at this new freak, and pursued her way, as soon as she felt sufficiently composed to do so, with many exclamations, and many dismal forebodings.

For her fears she had, indeed, very good grounds, as the young Hermit had encountered many perils in the course of his wanderings. On one occasion, as may have been gathered from the conversation, his escape had been a very narrow one. He had been caught by a dredge, and when hauled into the boat had been carelessly thrown at the bottom of it. Here, but for the interference of some large Waves, who turned the boat over, and thus restored him to his native element, his history would have ended. But yet it is out of this very circumstance

that the chief incidents of our story arise, since but for that the Hermit might never have gone "into society." He ever retained a grateful sense of his obligations to the Waves, and did not rest till he had found a way up to them from his home in the deeps, where it was, of course, impossible for them to come to visit him. As he was unable to swim, this was no easy matter, and many were his journeys of discovery till he succeeded in finding an upward path among the rocks, which took him into the region of the Waves, not far from shore.

Some of these exploring expeditions were made with great difficulty, for the bottom of the sea is as varied in its nature as the surface of the earth. There are hills and valleys, sandy and stony deserts, rocky passes, and mountain ranges; and these are covered with varying foliage of many-tinted *Algæ*, or, as you call them, sea-weeds. In some places the *Algæ* are low and bushy, but in others they spread into dense forests, where waves in stately grandeur the palm-like *Laminaria*, with its straight, smooth, brown stems rising many feet in height, and then crowned with large and widely-spreading fronds.

In these forests lurks many a monster of aspect strange and grim, ever lying in wait for the unwary traveller. One of these, fierce and powerful beyond

all, I must describe to you, little readers. Through the histories of Jack-the-Giant-Killer, and of other heroes, you are all of you, I doubt not, perfectly familiar with the appearance of giants and other earth-monsters; but I really do not think you ever imagined a monster with so many curious features as are possessed by this Cuttle-fish. Picture to yourself a roundish body, with no limbs or waist, dressed, one may say, in a sack, and joined to a head by a neck, scarcely worth mentioning as a neck. Its great eyes occupy the position of your ears, and from the crown of the head spread, in all directions, eight long tapering arms. In the centre of these arms, at the very top of the head, is the mouth of the Cuttle—a horny beak, like that of a parrot, with a sharp hard tongue inside. Terrible, indeed, are the Cuttle's arms, for not only are they long and flexible, winding snake-like round their prey, but they are also furnished along their edges with little suckers which seize the flesh with a grasp that ends only with the life of the Cuttle. The arms are used both for swimming and for walking, in the latter case either on the sea-bed, or on dry land, for the Cuttle sometimes takes a turn on shore. How would you like, some fine morning, when you are playing on the beach, to see coming towards you an object like a very exaggerated spider, and to

recognize a Cuttle taking his morning walk, head downwards, after his habit? Your first impulse, I fancy, would be immediate flight, and it would probably be the safest thing you could do, for you would scarcely like it if the monster insisted on shaking hands with you, or even on giving you an embrace. But you need not alarm yourself about such a possibility; we never hear of English Cuttles doing any harm, for they are of small size, and if it should so happen that you ever visit the countries where Cuttles are dangerous, you will always be able to ask the advice of the natives as to your best line of conduct, and to do as they do.

Still, though the Cuttles may seem of small size to you, they are very formidable monsters in the eyes of the little sea creatures, and therefore it may easily be imagined that when one of them made his lair in a gloomy cavern, on the borders of the forest, a wide-spread consternation was felt. The entrance to his abode was hidden by drooping fronds of the lovely *Delesseria*, never of so deep a rose-colour as when farthest hidden from the sun's light; and from this unsuspecting-looking retreat the monster would emerge, his great eyes glaring at an astounded victim, round whom one after another of the terrible arms would entwine in their fatal embrace. Many were the efforts made by the most

daring inhabitants to overcome their hated foe, but without success, in consequence of the various means of defence possessed by the Cuttle. Knowing that attack from the front was hopeless, they would wait and surprise him on his way home ; but, as he had the chameleon-like property of adapting his colour to his situation, it was difficult to keep him in sight ; and often when they thought they had at last come up with him, they suddenly found themselves enveloped in a dense dark cloud, formed by the dispersion through the water of a bag of ink, carried about with him for this purpose by the artful Cuttle. When the water cleared again, of course no trace remained of the foe, and the baffled pursuers saw only the crimson fronds of the *Delesseria* waving gently in the current.

Fortunately, our Hermit's way was not through the densest forests, or near the cavern of the Cuttle, but yet there were many obstacles which rendered his progress at times both slow and difficult. Chief amongst these were the numerous mud-banks, into the yielding soil of which he sank at each step. Here, too, he had to work his way amongst and around frequent villages of Oysters, Mussels, and Pinnæ. The Oysters generally selected half-buried timbers, or anything that raised them out of the mud, and gave them a more elevated position, but

the Mussels and Pinnæ were content with the mud, to which they moored themselves by fine silken ropes, which they spun for the purpose. As the Hermit approached the shore, wide prairies of the green *Zostera marina* opened before him, and if he had been an ardent lover of natural beauty he would have paused to look at the blossoms, the only *real* flowers which grow in the sea; but if he thought of it at all, he only thought the long slender leaves caught his feet uncomfortably as he tried to walk over them. Beds of the green *Ulva*, or Sea-lettuce, or Laver, he deemed more worthy of attention, and often turned aside to refresh himself amongst them, not, however, that he favoured any vegetarian theories, but merely because he knew they afforded shelter to countless little creatures agreeable to his taste.

You will feel disposed to admit that there were difficulties in the way to deter any but very enterprising spirits; but our Hermit, being of that class, found that dangers overcome only gave an added charm to his expeditions, and having once found the path he made frequent visits to the Waves, and was now, as we have seen, about to extend his travels still farther. He set off in great good-humour, prying sharply about in all directions for a new shell. As you may not quite know what he wanted, I may as well tell you that Hermit-Crabs,

having no shells on their backs as other Crabs have, supply the deficiency by taking up their abode in the cast-off shells of Whelks and other Molluscs; making a move from time to time as they outgrow their residence. Sad stories are told, and, I grieve to say, with every appearance of truth, of the ferocity and cruelty of Hermit-Crabs; who, for this reason, are often called Soldier-Crabs. It is even asserted that if they chance to fancy a shell still occupied by its original owner, they have no hesitation in seizing the unhappy Mollusc, forcibly dragging him out, and triumphantly taking his place inside; probably adding to their iniquity the farther sin of devouring him. But, on the other hand, some very good authorities maintain this assertion to be no better than a slander, declaring that the Hermits not only *do* not, but *could* not molest the shell-fish, many of which have doors which they can firmly close in case of alarm.

All authorities, however, agree in proving that the Hermits have no scruples about attacking each other, and that if one should desire the shell occupied by another he would instantly, if he were the stronger, compel an exchange. Darker stories still are whispered, amounting even to cannibalism, but over these we will drop a veil. In Mr. Gosse's "Aquarium," and in Mr. Lewes' "Sea-side Studies," there

are some descriptions of encounters between Hermits, very amusing indeed, although they do not raise our opinion as to their benevolence of character. I *have* heard that no two Hermits will live in peace near each other, but that in the end one or other must be subdued, and compelled to keep himself in retirement. This makes the warlike name seem the most fitting one for them, unless we remember that Hermits, in retiring to live apart from their race, show, though in a milder degree, the same want of brotherly affection that is manifested in the pillage and slaughter of war.

Although it may a little interrupt our story, I am sure you will all be interested in an amusing description of these Crabs, given by Mr. Lewes, and that he will allow me to copy it for you. I must tell you that he calls them by their scientific name, *Pagurus*. He says, "All the fore-part of *Pagurus*, including his claws, is defended by the solid armour of Crabs. But his hind-parts are soft, covered only by a delicate membrane, in which the anatomist, however, detects shell-plates in a rudimentary condition. Now a gentleman so extremely pugnacious, troubled with so tender a back and continuations, would fare ill in this combative world, had he not some means of redressing the wrong done him at birth; accordingly he selects an empty shell of con-

venient size, into which he pops his tender tail, fastening on by the hooks on each side of his tail, and having thus secured his rear, he scuttles over the sea-bed, a grotesque but philosophic marauder."

You will observe that popular opinion does not give a high place to the moral capacities of these Crabs; but still it is admitted that there is no rule without an exception, and there is no reason why *our* hermit should not be this exception, and be of a decidedly superior cast of mind. His infancy as a *Zoea*—a stage through which all young Crabs pass—had been spent in free and joyous wandering, and when finally, after the metamorphosis by which the *Zoeæ* pass into the Crab state, he settled down—at first in a small Periwinkle shell—he retained in an unusual degree his infant love of motion; but still his childhood and youth had been passed in the selfish seclusion natural to Hermits, and until the adventure we have noted, he had cared little to make acquaintance amongst strangers. It is probable therefore, that, although his love of travelling may have tended to enlarge his views, he owed still more to his friendship with the *spirituelle* Waves and Sunbeams. We know that *we* are all greatly influenced by our friends and companions, so why should not Crabs be so too?

Of one thing at least I am quite certain, that our

friend did not even dream of disturbing any poor Whelk, but was perfectly content with empty shells. It is amusing to contrast the proceedings of the Hermit before starting on his journey with our own in the same circumstances. If we were going to make our entry into "society" for the first time so far from home, how should we be busied with packing up trunks, and bonnet-boxes, and carpet-bags; but the Hermit, more fortunate in this, had only to pack up *himself*. You would have laughed to see how he managed it: trying first one shell then another, cautiously inserting a foot or claw to feel if it was empty; and then, after looking in all directions to see that no enemy was lying in wait to seize him in his unprotected state, popping rapidly from one to another. But to ensure having a refuge in case of failure in his attempt to make a change for the better, he took good care never to quite loose his grasp of the old shell till he had secured the new one. It was only after repeated trials, and some decided disappointments, that he felt himself perfectly comfortable; for, on so important an occasion, one may imagine him to have been unusually fastidious. One of his disappointments arose from his taking possession of a shell still occupied by its proprietor. As the Hermit put in his claw the Whelk in alarm retreated to his innermost chamber,

making the Hermit suppose that the shell was empty. He accordingly took possession, wondering, however, that in so large a shell the accommodation should be so limited. But before he could settle himself in it, the Whelk, having recovered from his alarm, began to resent the intrusion, and to come out again, pushing the intruder before him with great indignation. Of course, as soon as the Hermit was thus made aware of his error, he took his departure instantly, and was more careful than ever in all succeeding essays.*

Not only did he seem destined on this occasion to experience to the fullest extent the trouble of "moving," but even after he was quite settled in a suitable abode, and was pursuing his way rejoicingly, an adventure befell him which might have had a fatal influence on our story. He was passing over a very bare tract of country, with not a single stone or shell to break its monotony, when he encountered a dark-coloured, savage-looking Hermit, in a most disreputable, battered old shell. Our friend would have passed without remark, but not so minded was the stranger, who looked with envious eyes on the neat clean shell, deciding that he would make an exchange. "Stop!" said he, imperiously, "what do you mean by trespassing on my lands? You

* Sea-side Studies, p. 50.

deserve to be punished, and as I want a new shell you shall give me yours, and you may be glad to get off with so light a fine !”

So saying he extended his powerful claw, and, without giving time for a word of remonstrance, dragged our poor Hermit out of his new dwelling, and took his place inside with the utmost speed. I have said that our friend was of an unusually mild disposition, but whilst in the very act of rejoicing in the possession of a new house, to be thus uncere- moniously hauled out of it, was too much for even the strongest patience. Peace-principles belong to a higher plane than Crab-life, and though our Hermit was not given to indulge in offensive, he had no scruples about defensive warfare, so he roused him- self at once and valiantly attacked the usurper. The contest was long and severe, and the shell changed ownership many times ; but at length, as the stranger lay panting on the sand, a well-directed pinch gave our Hermit the victory, and he recovered his shell with jubilant satisfaction.

His next encounter, but this time a very harm- less one, was with a Strawberry-Crab, a pretty little creature, with a shell studded over with pink tuber- cles on a white ground.* Unfortunately, like many

* For a full description of the Strawberry-Crab, see Mr. Gosse's " Aquarium."

other pretty little creatures, the Strawberry-crab was a vain and conceited little creature ; and as she paused on a branch of *Fucus*, or Bladder-wrack, up which she was climbing, she looked down pityingly on the Hermit, as she observed him quietly pacing along the ground, and exclaimed,—

“ Oh, you poor thing, how I do pity you, for being obliged to creep along in that slow way ! If you only knew how charming it is to be able to climb, as I do, you would never endure such a motion as yours.”

The Hermit looked calmly up at the speaker as he replied,—

“ Then I think it is a good thing that I don't know, for as I can't climb, it is as well for me to be content to walk. I do not, however, care about climbing on branches, for I don't see the use of it. I can get up or over rocks, and for the rest I like the solid ground. Besides, I think I like my own arms better than yours, which are so long and awkward, and I suppose you have them so because you climb.”

The Strawberry-crab was highly indignant at a creature with a great clumsy Whelk-shell on its back presuming to object to anything about her own elegant person. Her arms certainly were very long, with rather awkward elbows, and twisted wrists ; but

this was as convenient for her as the long arm of a monkey is to it, and she could not for a moment consider it a defect. And again, as she found walking on flat ground to be unpleasant to *her*, she was quite sure it was a mode of proceeding which could only be condemned. She did not see that the Hermit, in like manner, judged from *his* own feelings, and that from his point of view he was as correct as she was from hers. If they could only have changed places for a moment, each thus gaining the other's view too, they would not have parted, as they did, in mutual contempt. But, when even human beings act in such a way to each other, what better could be expected from Crabs?

The Hermit after this steadily pursued his way upward, till he reached his friends the Waves, who, though they were engaged in a merry game with the Sunbeams and some lively little Breezes, received him with great cordiality. It was decided that, as soon as he was sufficiently rested and refreshed, he should be entrusted to the care of a large Wave then going shore-ward. The Wave gladly accepted the charge, and, promising to take every care of him, bore the Hermit, full of eager expectation, away towards the unknown world of wonder before him.

CHAPTER II.

THE tide was going down, one summer day, on the dear old Devon shore; leaving uncovered as it went one of the prettiest little nooks in the world. It was a sheltered rocky Basin, cool and yet bright, round the sides of which grew quite a thick shrubbery of the loveliest sea-weeds. Countless little animals had their home here; most of which, my little readers, would have escaped even your quick eyes, they were so very small. But there were many which you would have seen, and which would have given you great delight. Pretty Star-fishes were spreading their gaily-coloured rays, in lazy enjoyment, over the jutting edges of the rock; or were crawling about on their thousand feet in search of their prey. There were Sea-Urchins, too, alive and active, which would certainly have rejoiced your hearts, for you are always so pleased when you find their empty shells,—Sea-eggs, as you call them,—

on the beach. Prawns and Shrimps abounded, and bright Fishes darted through the water, or lurked in the dark recesses of the numerous hollows and fissures, that gave to many creatures the darkness which they prefer to light. And numberless shells with their curious inmates studded the rock, and glistened among the sea-weeds.

In some places the larger sea-weeds grew in dense masses, in others the gay tints of the smaller ones gave the appearance of rich flower-beds, whilst the more elevated portions of the rock, which were left exposed at low tide, were covered with green sea-grass, forming here and there patches of fairy lawn, where the young grass and weeds were kept smoothly mown by the busy Tops and Periwinkles. You may look astonished, but it is quite true. These little creatures are furnished with a wonderful tongue, long and sharp, with which they mow down young grass in regular strokes, like those of a mower's scythe. If you have an Aquarium you will soon find the glass sides covered with a green film, which obstructs your view, and which is only the growth of the tiny seeds contained in the water, or from the sea-weeds already planted. The cure for this, according to Mr. Gosse, who knows all about such things, is to procure some of these rather slow but still very sure little mowers, who will soon keep

your grass in good order. For fresh-water aquariums Pond-snails will perform the same good office.

But of all the wonders of the Basin, and there were more than I could describe in a volume, you would, I think, have been most charmed with what you would have called beautiful flowers, dahlias or chrysanthemums, growing about the sides. But, no; they are not flowers: they are animals, though they are commonly called by the name of a flower, Sea-Anemones. Each of those delicate petals, as you would at first sight suppose them, is really an arm, instinct with life as it moves gracefully to and fro, and not, as you might imagine, swayed aimlessly by the motion of the current. The Anemones are of many kinds and colours; some small and delicate, others large and gorgeous in tint. But to form any idea of their beauty and variety you must see them for yourselves, either in the rocky pools which are their favourite haunts, or in the Aquarium House at the Zoological Gardens.

All these varied inhabitants of the Basin were pursuing the usual occupations or amusements after their ordinary fashion,—some of them, perhaps, stirred to a little extra-excitement, as they looked forward to the change which the going down of the tide made daily in their lives,—when a sudden commotion was produced by the noisy entrance of a

large Wave, who bounded in, bringing with him a heavy object which he deposited on the sandy floor at the entrance of the Basin, saying, as he did so,—

“I will come back for you in good time; till then, I hope you will enjoy yourself!” Then, as he bowed himself out, he added, addressing the community at large, “The tide has gone down faster than I expected, so that I had some trouble in getting this far, or I would have stayed longer; but I leave with you a friend of mine as a visitor. Treat him well for my sake!”

As soon as the water was quiet again, there was a general stir among the inhabitants of the Basin to see what the visitor was like. Even the Zoophytes showed a languid interest; and much more than that, you know, could not be expected from them, as they are almost as much plant as animal—at least, in outward appearances. But *do* you know, little friends, that all those crisp, sand-coloured, coral-like seaweeds, which you pick up on the beach, are not sea-weeds at all, but are Zoophytes? At the point of each of those tiny branchlets once lived a lovely little animal, star-shaped or flower-shaped, quite as beautiful as the Anemones, though not to be seen without the aid of a microscope.

It is worth our while to pause and think of this wonderful microscopic world that lies everywhere

before our eyes, and is yet unseen by them. On land and in the sea there are myriad forms of animal and vegetable life; exquisitely beautiful, and perfect beyond imagination, in tint and structure, yet invisible to our unaided sight. I know of nothing earthly that so fills my heart with reverential awe and utter humility, as the thought of the beauty and perfection of these tiny creatures, which are so wonderful in their adaptation to their circumstances, or so admirable in form and colour. We are very apt to think of Infinite Power only in connection with the grand aspects of Nature, especially in the grandest of all, the revelation by the telescope of the wonders of the starry heavens; but, when we think of it, the infinitely small is as marvellous as the infinitely large. Indeed, it may impress us even more forcibly, since we are the better able to comprehend it.

Have you ever seen through a microscope, dear children? I hope so; or that, if not, you may soon have that pleasure. Then, do not forget to notice one thing particularly. It is this, that if you take the finest textures of man's workmanship,—delicate lace, filmy muslin, all that is finest and rarest, on which the most careful thought and labour have been expended,—you will find that, however beautiful it may be, it will grow coarse, and show some

defect as you look at it under the microscope ; but take the commonest weed or insect, the seed of the despised grass beneath your feet—nothing is too insignificant—and then notice the difference : now the increased power of vision shows beauty unseen before ; beauty of form, of colour, of fitness, of which you have perhaps never even dreamed. Should we not, in our admiration of the wonders of God's work, always remember to be very grateful to Him for surrounding us with so much beauty ? And should not this gratitude make us strive continually to know more, and to love more, that which He has given us ? It is a glorious thought that the more we know of God, in His works as well as in His Word, the more we must love, for we ever find new perfection. And growth in this knowledge is before us, as our work and our reward, through all eternity—if we will only choose to have it so !

But where are the Zoophytes leading me ? Much farther than I intended : farther, perhaps, than you will all like or understand. Yet, I will leave what I have written, hoping that a thought so full of delight to me, may also please you ; if not now, it may be at some future time. Meanwhile, as we left the inhabitants of the Basin in a state of great excitement, we will return and see how matters went with them.

A large Sea-Slug, stretching himself lazily out and

raising his horns as he peered around him, was the first to make any remark, as he muttered,—

“I hope it is something good to eat!”

“You might sometimes think of something more than eating!” said a lively Prawn, looking about for the visitor, to whom she intended to give a cordial welcome, for the sake of the Wave, as well as also that she was fond of novelty, and had a large share of curiosity concerning all that took place in the world. After looking round with her large quick eyes in all directions, she turned away pettishly, exclaiming, “Nothing but a frightful old Whelk-shell on the sand! Those Waves are always making fun of us!”

The shell, as you have doubtless long since guessed, was no other than our friend the Hermit, who did not at once collect himself after his rather rapid journey, in which, as he could not keep pace with the Wave, he had been obliged to tuck up all his feet in the shell, and let his friend carry him bodily. As soon as he began to come out he was observed by an inquisitive young Fish, who had been swimming inquiringly round the shell, and who exclaimed,—

“Oh, it’s alive; it moves; and it has claws like the Crab! You had better all look out!”

Thus saying, the Fish darted off to a safe distance

causing the utmost alarm to a young Top, who had already commenced operations on some tiny weeds sprouting on the shell, and who at this outcry shrank at once into the smallest possible space, and fell back on the sand in a fainting condition.

The Crab mentioned by the young Fish was one of those known as "Velvet Fiddlers," and he had recently come from the depths, where he had his winter residence to spend the summer on the coast,* establishing himself under a large stone in the Basin, where he set up as a very grand personage indeed. He talked loudly and largely about his "family," and especially about his "cousin, the Lobster," who was the head of all the Crustacean race, and was, according to his account, everything that was wonderful and noble. But of his numerous Crab cousins he said much less, and he did not encourage their visits to the Basin. Many of them were dingy in colour, and not very refined in their habits, and some of them were certainly engaged in low occupations; one family, the *Maiadæ*, very near rela-

* Cuvier mentions that the *Portunidæ*, or Swimming-crabs, to which family the Fiddler belongs, leave the coast in the winter, and retire to the deeps. The Fiddler, he also says, lives in very deep water. A more intimate acquaintance with the particular fiddler before us may be made in Mr. Gosse's "Aquarium," (page 187), by any reader who may desire it.

tives of the Velvet-Crab, being, as it is asserted, the scavengers of the sea. These, he thought, were not at all aristocratic, and he considered himself entitled to look down on them, because he was not obliged to do anything useful, and happened to wear a fine brown velvet coat, and to have large, strongly defined claws—an important feature among crabs—beautifully marked with scarlet and azure, as well as also a glossy black edge to his shell, and vermilion eyes. It is a very good thing, no doubt, to be distinguished in appearance, but of course we all know how ridiculous it is for any one to pride himself on such a thing, while it is quite certain that there is no surer mark of vulgar-mindedness than the being ashamed of poor relations, or of those who are not so well-dressed, or so well-off in the world as we are. This being the case, no one will wonder that the Velvet-Crab was unpopular in the Basin; although, from the violence of his temper, few dared show their true opinion of him, with the exception of one special enemy of his, a fish who, amongst a variety of odd names, rejoices in that of “Pogge” (which I imagine to be a word of *two* syllables, pronounced with the *g* *soft*). As the Pogge always wore armour, he was indifferent to the claws of the Velvet-Crab, and took no pains to disguise his feelings towards him.

This Pogge, by the way, really deserves a few words of description, which I will give in Mr. Gosse's own words, from his "Aquarium." He says, speaking of these fishes, "One had attained the length of five inches, nearly the full dimensions of the species. The small ones were black, but the large ones a dull, dirty grey. The most marked peculiarity of this little fish is its armature. It is clothed, like a knight of the age of chivalry, in a suit of plate-mail, *cap-à-pie*. Every one of the bony plates of which its *lorica* is composed is furnished with an elevated central keel; and as the plates run in regular longitudinal series, the surface of the body is armed with eight elevated sharp edges, running from head to tail. The huge head bristles with spines and bony points, and the nose terminates in a couple of spines that turn up and curve backwards like the horn of a rhinoceros in miniature, while the whole under surface of the head, which is flat, is covered with a beard of horny, thread-like filaments, very numerous and close set, hanging perpendicularly downwards."

You will see from this that the Pogge was no contemptible enemy, even for the Crab; and as the hatred was mutual, they kept up a continual petty warfare, which, however, did not come to much, the combatants being both so well armed.

As the young Fish discovered the Hermit's claws, the Crab happened to be coming from under his stone, and on hearing his own name, he strutted pompously out, exclaiming,—

“Hey ! what's the matter ? What's that ? What's like my claws ?”

The Prawn, who had been again attracted by the exclamation of the Fish, gladly embraced so good a chance of teasing the Crab, whose talks about his “family” had often bored her extremely, so she said slyly, but in the sweetest and most innocent manner imaginable,—

“There it is, in that old shell. One of your cousins, is it not ?”

“One of my cousins ? Certainly not, madam !” said the Crab, sharply. “Are those great, unequal, awkward things like *my* claws ? Does that ugly shell look like *me* ? I beg to inform you, madam, that *my* family have always had houses of their own, without borrowing those of common Shell-fish.”

“Pray don't discompose yourself,” said the Prawn, “I naturally thought that as the creature had claws, he was a relation of yours.”

Several young Crabs of various ages had also gathered round, displaying quite the same feeling as the old Crab. It is quite possible that they were his children, but if they were he never took the slightest

notice of them, but left them completely to their own devices. On his arrival in the Basin, the Crab had been accompanied by his wife, but she had before long disappeared, having probably returned to the depths in consequence of the difficulty of living with a creature so unamiable. The desertion of her family would never trouble her, since even if she had remained, she would not have bestowed any attention on them, such a thing not being the custom among lady-crabs. It is not to be wondered at that being thus thrown on their own resources, and having no better example before them than that of their father, the young Crabs should have early shown the same disagreeable tendencies. They stared at the poor Hermit in the rudest way possible, freely expressing their opinions.

“The idea,” said one, “of recognizing a creature like that as a relation because he happens to have claws!”

“And such claws!” said another.

“Not a pair at all, for one is as large again as the other!” added the first.

“Did you ever see such a guy?”

“How awkward he is!”

“It is quite certain that he has never been in society!”

“He has not a word to say for himself!”

“What does he want here?”

These and a shower of unfeeling expressions greeted the astounded Hermit, who, having been accustomed at home to a good deal of consideration, was at first almost petrified at his rude reception. After surprise, his next feeling was violent indignation, and his impulse was to rush upon the young Crabs and inflict immediate chastisement. But he finally decided to treat them with silent contempt, in doing which he certainly consulted his own dignity, for, of all undignified things, the most so is to return railing for railing, or rudeness for rudeness. The higher virtue of returning good for ill could not be demanded from even the most amiable of Crab-kind.

Our Hermit, addressing the old Crab, said, in as calm a tone as his feelings allowed,—

“Well, cousin, though you do refuse to acknowledge me as a relation, I don’t see that you need make such very personal remarks. My shell may not be so grand as yours, but still it suits me, and I don’t think any the worse of it because it was occupied before. It strikes me, indeed, that in being able to move to a new house whenever I like, I have the advantage of you.”

“I suppose I can get a new shell when I want one, and that not a borrowed or stolen one either,” returned the Crab, very haughtily.

The Hermit overlooked the sneer in the last words of the Crab, and answered quietly,—

“It is true that you can get a new shell when the old one is too small, but you have some trouble in getting out of the old one, whilst I can make my exchange in a moment. Then your new shell is soft at first, and you are exposed to danger till it grows hard.”

“So are you, when you get new shells on your claws,” said the Crab.

“That is a trifle compared with your situation, without anything whatever to defend you,” said the Hermit.

“Just listen to that,” said the Pogge, who from a favourite dark corner was watching the proceedings, and who caught at this intimation with eager delight, whispering to his wife, “Don’t I wish I had known that before? But there’s no fear of my forgetting it again. We will watch our chance, and the next time the Crab has a soft shell won’t I pay him off for some of his insolence! I will at least have the satisfaction of sticking some of my sharpest spines into him!”

The way in which the Pogge dwelt on the words *at least* showed that this was by no means the limit of his intentions regarding his enemy, at whom he glared with an expression of vindictive triumph.

“I wonder very much,” said the Prawn, resting

herself against a clump of sea-weed, and glancing complacently as she spoke on her own elegant form, and delicate transparent skin, “I wonder very much that while you were changing your shell you did not select a more graceful and polished one.”

You may consider, perhaps, that the members of society under the Waves speak to each other with a plainness which scarcely meets your ideas of strict politeness: but this society has amongst other peculiarities that of being perfectly transparent; when an animal does speak, he always speaks the exact truth. The Prawn, therefore, was not infringing any of the proprieties of the most refined circles when she thus frankly expressed her opinion of the Hermit's appearance. It would scarcely be quite in the best taste if we, on our introduction to a stranger, commenced with an inquiry respecting his tailor, and offered to recommend him another; but who, in society as we know it, ever thinks of making his own doings the absolute measure of right for all the rest of the world? We, therefore, do not think the less of the Prawn for her straightforwardness, nor did the Hermit, who never thought of taking offence; but, leaving the Crab in the act of preparing a crushing rejoinder, which was to utterly silence everybody who did not agree with

him, turned to the Prawn, and, looking at her with honest admiration, replied,—

“ I dare say your remark is just ; but then, you see, one cannot always get all one would wish. My choice of shells is rather limited, so I am obliged to consider comfort more than appearance. If I chose a shell for its look, it is very likely that it would be an inconvenient one.”

As the idea of sacrificing comfort to mere outside show is unknown even to the vainest animal, this was considered a most perfectly satisfactory reason by the Prawn, who merely remarked,—

“ Well, I am glad I don't need a shell of that kind. I should be very much troubled at the thought of not being able to keep it clean. Can you clean yours in any way ? It does not look much as if you could.”

The Hermit stared, as if this was something quite new to him, and answered,—

“ No, I never thought of such a thing. It never troubles me. If the weeds grow too large and thick they certainly are a nuisance, but in that case I change my shell. Crabs in general do not at all mind weeds ; not even those Crabs which have shells of their own. You should just see *Maia squinado*, the large Spider-crab : he is always covered with whole families of Zoophytes ! And I have often seen old Crabs with thick plantations of sea-weeds on their

backs. One I knew had a large sponge on his, but that was really very convenient; because, for one thing, the sponge was a shelter from enemies, and, for another, the Crab's prey came unsuspectingly into the sponge, and were thus easily caught by him."

"How dreadful!" exclaimed the Prawn, "I could not live a week if sea-weeds and things grew on my back."

"Oh, it's nothing when you are used to it!" said the Hermit. "There is one family of Crabs which always catch a soft, spreading Zoophyte, and make it grow so as to cover the shell. Some of the same family fix an old bivalve shell over their own, holding it on with some of their feet, which turn upwards for that purpose. For my part, I think it is much better to live in a shell altogether, than to stick one in that way on one's back."*

"It must be very miserable," said the Prawn, with a shudder.

"Have you some way of keeping yourself clean? I do not see any traces of weed about you," said the Hermit.

"I should hope not," replied the Prawn, horror-

* The family of *Dromiadae* are said to use these singular means of concealment or protection. See Cuvier's "Animal Kingdom."

stricken at the suggestion. "Of course I can clean myself," she added, holding up two of her front feet, which were covered with hairs standing out all round, like a bottle-brush. "I keep these feet on purpose, and spend all my spare time in brushing my dress."

"Really!" said the Hermit, rather interested in the notion. "Now I think of it," he continued, "there is a cousin of mine, a very little Crab, who holds the same views on that subject as you do."

"Yes, I know him well; you must mean the Broad-claw," said the Prawn. "He has two feet not unlike mine, and we have often conversed on the subject of proper attention to personal appearance. Many of the creatures here are shockingly deficient in that respect, so that it is very refreshing to meet with any one who has any correct ideas on the subject. Certainly, the Broad-claw does not succeed in keeping himself quite clean, but he does use his brushes very carefully, and if he could only be persuaded to take a daily swim, I dare say he might soon look as well as I do. But, unfortunately, he is rather lazy, and prefers to stay at home, which he can do, as he has all his food brought to his door. His claws are provided with a net of fine hairs which sweep up everything that comes near, so he never need give himself the trouble of moving

out. It is a pity, because staying constantly indoors is not favourable to cleanliness. The sand and mud gather about him, and stick to his hairs in a very disorderly way.”*

“Yes, I suppose he is quite hairy all over. There are not very many Crabs which are so,” said the Hermit.

“Indeed?” said the Prawn, “I should not like to be covered with hairs; I think a smooth skin so much the nicest. But I like the Broad-claw family very much, they are interesting in many ways. It is a pity, however, that they are so retired in their habits, for one scarcely ever sees them. Several live under that very flat stone in the shade there. You would expect them to be squeezed to death, but they seem to like it, and don’t stir out from one week’s end to another.”

“I can’t understand that,” said the Hermit, “it must be so very dull. I could not now live without travelling. If the Broad-claw never moves out, I should think he would indeed need brushes, for there are so many creatures ready to make their dwelling on a Crab’s back.”

* The reader will find Mr. Gosse’s account of this little Crab in “The Aquarium,” (page 39), full of interest and amusement. Further particulars are given in the July number of “Good Words,” 1864.

“How exceedingly uncomfortable!” said the Prawn, “I *am* glad I am not a Crab. And so you really can’t brush yourself. I *do* pity you.”

The Hermit looked as if he troubled himself very little about the privation, but he answered politely, that doubtless being accustomed to a thing made a difference in one’s opinion of it. He then changed the subject by inquiring if the Prawn was related to the Lobster, whom, he thought, she resembled in appearance.

“Oh, yes,” said the Prawn, “we belong to the same race of crustaceans, the *Macroura*, who are distinguished for having long tails. My nearest relations, however, are the Shrimps. I care less about the Lobster, though, of course, I respect him as the head of the race. He is rather too large and grand for me, and I am, on the whole, a little afraid of him. I do not know much of him personally, but I have heard a good deal about him from the Velvet-Crab, who pretends to be a near relation of his, and also from the Broad-claw, who I believe is a near relation, because I see so many points of likeness between them. The Broad-claw has long *antennæ*, and he has fringed swimming-plates on his tail, which is a very fine one.”

“A little conceited upstart! I hate him!” said the Velvet-Crab viciously, for he could not bear the

thought of any Crab being more like the Lobster than he was.

No one, however, took any notice of this interruption, and the Hermit said in answer to the Prawn,—

“Yes, the Broad-claw is very closely related to one little Lobster, and through him to the large lobsters. The Broad-claw is a cousin of mine, belonging to the *Anomoura*, who have tails peculiar to ourselves.”

“Have you a tail?” said the Prawn. “Then you are related to the Lobster, too, and in that case must be a relative of mine, too. How odd!”

“Yes, I suppose it must be so, though I had no idea my relations were so numerous,” said the Hermit. “Certainly I have a tail, it is in my shell. I do not know much of the Lobster,” he continued, for he was of too truthful a disposition to let the Prawn suppose that he moved in more aristocratic society than was the case. “We move in different circles, and seldom meet. As the Lobster has never recognized the relationship, he may not know of it, though it is so close.”

“Very likely, indeed, that he would acknowledge *you!*” said the Velvet-Crab. “I don’t believe a word you say.”

“I don’t know that he would acknowledge you, either,” retorted the Hermit, in a quiet tone. “I am more nearly related to him than you are, but I

never heard of his paying any attention to any of us Crabs."

Before the Crab could command his temper sufficiently to make any reply, the young Fish, who had been listening attentively, now interrupted them, saying pertly to the Hermit,—

"Could you not come out of that shell of yours, and let us see how you look without it? I should like to see you, and if you were only rid of that heavy old thing, you might have a fine swim in this warm water."

The Hermit manifested no impatience at this impertinent address, but answered mildly,—

"My young friend, when you are older, and have seen more of the world, you will discover that your own experience is not the measure of everything. To a creature covered with scales, the exercise you suggest may be agreeable, but to me, who am thin-skinned, and who have not attempted it since my infancy, when, indeed, I was a very good swimmer, the idea of parting with my shell is objectionable, and I must decline doing it. One of my few trials of doing without my shell was the most painful episode in my life."

Quite overcome by the mildness of the rebuke, as well as the dignified manner in which it was given, the young Fish begged pardon, and entreated

the Hermit to relate to them the adventure to which he alluded. But before there was time to comply with the request, the Crab said, scornfully,—

“A fine way indeed to get out of a difficulty! To pretend that you don’t like swimming, when you know quite well that you don’t know how to swim.”

“I do not deny that,” said the Hermit, “I never pretended that I could swim now. I have quite given it up since I took to living in shells, and have forgotten how it is done.”

The Crab, nothing softened by this frankness, said,—

“Of course you can’t swim, and yet you pretend to be my relation! None of you common Crabs,—though, mind, I don’t admit that you are a Crab at all—none of the common Crabs know how to swim; at best, they can only shoot slantingly through the water, and yet they claim to be more nearly related to me than the Lobster is, though all my family swim as well as he does.”

“I should very much like to see if the Lobster would own you!” said the Prawn, weary of the Crab’s arrogance. “I do not believe he would. If I were he, I would much rather have the Hermit for a relation, even though he has no way of keeping his shell clean.”

“Does he own *you*?” sneered the Crab, who would

never allow himself to be convinced of the relationship of the Prawns and Shrimps to the Lobster.

“It does not in the least matter whether he does or not; I am independent of all relatives, however grand they may be!” returned the Prawn, in a lofty manner.

A little scene ensued here, in which various animals expressed loud indignation against the Crab for his extreme rudeness to the stranger; until, finding that he had the worst of it, and that the popular feeling was too strong against him, he retreated to his stone in a very savage frame of mind, murmuring something about “a respectable family disgraced by vagabonds,” and solacing himself by snapping up an unfortunate Worm which happened to be crossing his path; of which he refused to give the least morsel to any of the young Crabs, who were accustomed sometimes to pick up scraps of any booty which he secured.

As soon as the Crab was gone, the young Fish reminded the Hermit of his story, which he at once gave, as follows:—

“It was in one of my exploring expeditions that I chanced, after a long and fatiguing ramble, to rest near a rock, in order to recruit my exhausted strength. When I awoke from a refreshing slumber, I was about to resume my journey, when lo! my shell was fast. Do what I might, it

would not move. I soon found that I had rested too near a Sea-Urchin, who was attached to the rock by many of his sucking-feet, and who, angry at my supposed intrusion, had seized my shell with his opposite feet and was holding it fast. There I was : I could not drag the Urchin away from the rock, and the Urchin would not loosen his hold for all my entreating ! I begged and prayed, and reasoned with him in vain, till at length, being almost famished, I was compelled reluctantly to abandon my shell, and proceed without it in search of food. Never shall I forget the anguish of that journey ! Cold ; and hungry, and frightened, I pursued my way for many hours, unable to find a shell of any kind. At last, when I was almost despairing, I saw a large empty shell ; much too large, and most uncomfortable, but more welcome to me than I can say. Its point was broken off, which caused a violent draught through it—a thing to which I am unaccustomed, and consequently dislike, but I had to endure it till I found a better shell, which was not for some time afterwards. Since then I have always been careful, in selecting a resting-place, to be perfectly sure that it is not in the neighbourhood of a Sea-Urchin.”

“ Then you had better mind what you are about now, for there is one just behind you,” said a Starfish, from a ledge of rock above the Hermit.

The latter, amid warm expressions of interest in and thanks for his story from all his listeners, moved a little farther away, but still remained within speaking distance of the Urchin, at whom he looked with considerable curiosity.

CHAPTER III.

HE Sea-Urchin, addressing the Hermit, said quietly,—

“ You need not alarm yourself about me. I shall not touch you if you let me alone; nor would the Urchin, of whom you spoke, have done so, if he had not supposed he was defending himself from attack. You probably brushed against him, and he thought you meant to break off his spines. I can assure you it is not pleasant to have one's spines broken off.”

“ But when I explained and entreated, I think he might have given me back my shell,” said the Hermit.

“ Well, so he might,” responded the Urchin. “ But he was most likely one of those weak-minded individuals, who, when they do happen to get an idea of any kind, cannot let it go again. Having once decided that you were an enemy, he resolutely kept to the notion.”

“ And with it, to my shell also !” said the Hermit.

“I had no idea that such delicate suckers could have so much force in them. I suppose that those suckers are your hands, and the spines your feet, are they not?”

“Not exactly so,” answered the Urchin. “The suckers are hands, but they are quite as much used by us as feet: we walk partly with them, and partly with the spines. The suckers serve to keep us firm and steady. Some of our Star-fish cousins have only spines and no suckers; others have suckers and no spines, but we have both.”

“How do the suckers come through your shell?” asked the Hermit.

“Through rows of little holes left on purpose for them. The true Star-fishes, which have suckers like ours, have them in rows down the under-sides of their rays. Some families have two ranges of suckers, some four, and some seven.”

The Hermit, looking round the Basin, discovered that there was quite a gathering of Star-fishes of various kinds. There was the twelve-rayed Sun-star, in his bright scarlet dress; there was the Eyed Cribella, with five finger-like rays, tapering to a blunt point round a very small central disk; the common “Five-Fingers,” with thick red rays, was very numerous; and even the Brittle-stars were not without representatives, though these generally live in the

depths. They differ from true Star-fishes in the nature of the rays ; which in the latter are essential parts of the body, but in the Brittle-stars are only spinous appendages, and may even be thrown off without serious injury to the animal. The Brittle-stars are exceedingly active, and naturally suggest the description which has been given of them, as “a small Sea-Urchin surrounded by five very lively centipedes.” As the Hermit looked from the Urchin to the Star-fishes, he exclaimed in astonishment,—

“Are those really your cousins? I should never have thought it!”

“Yes, they are my cousins,” said the Urchin, “I have a very wide circle of relations, very varied in appearance. My own family-name is *Cidaris*, and we are distinguished from our first-cousins, the *Echini*, by our large and brightly-coloured spines. They have more spines than we have, but ours are the prettiest. We are highest in rank of all the Urchins, because we are round and graceful. Another large family, the Heart-Urchins, are not round, and all their spines, very fine ones, are turned in the same direction. This is because the Heart-Urchins burrow in mud or sand, which they could not easily do if their spines stood out all round. The third family, the Cake-Urchins, are almost flat, and are closely related to the Cushion-stars. It is in this

way that we are connected with the Star-fishes. That is one of the Cushion-stars going up the rock," and as he spoke the Urchin pointed to a Bird's-foot, conspicuous for its bright and lovely colour.

"Do you mean that roundish flat creature?" asked the Hermit. "He does not look like a star-fish, though there are rows of spines down his back where rays ought to be."

"It is his peculiarity to have his rays connected by a thick skin which makes him seem round. But he is a Star-fish, and is cousin to that Feather-star, the most beautiful of them all," said the Urchin.

The Rosy Feather-star was a cousin, who might justly be an object of pride. It was not flat, like the common Star-fishes, but its rays—ten in number, with two springing from a single basal joint—curved gracefully upwards, like the petals of an expanded crocus. These rays or arms we may, for the sake of the comparison, call *pinnated*, after the fashion of the common fern, a pair of leaf-like expansions, or *pinnæ*, spreading from each of the numerous joints composing the arms. The cup-like centre from which the arms radiated was the body of the Feather-star, and to the outer side of this centre were attached a "number of jointed stony threads, like necklaces, much shorter and slenderer than the arms, which serve as clasps,

gripping and holding firmly the projection of the rock, by means of the strong curved claws with which they are terminated, in shape like those of an eagle.”*

“But I have relations much more curious than these,” pursued the Urchin, pointing out a Sea-cucumber, which, having fixed itself between two pieces of rock by some of its suckers, was protruding its worm-like body, and with the rest of its suckers and its tentacles was making investigations in all directions as to the nature of its surroundings.

“Would you suppose that to be a relative of mine?”

“That is an Anemone, with a Worm’s body,” said the Hermit, being, not unnaturally, misled by the tentacles, which somewhat resemble those of the Anemone, though they are more branched and feathery.

“No, it is not an Anemone, though there is of course a distant connection between them,” said the Urchin. “The *Cucumaria* is also very highly connected, for it is a relative of the *Annelida*, through that Siponcle, whom you see lying near.”

“Well, that is certainly the least like you of all your family,” said the Hermit, looking at the Siponcle, a Worm with a thick rounded body and a long neck.

“The only point of resemblance is in the ray-like

* Mr. Gosse, “Good Words,” for July, 1864.

arrangement of those tentacles round its mouth: they are very tiny ones, but still they are really proper tentacles," said the Urchin.

The Siponcle here turned to the Hermit, and said,—

"Do you know some cousins of mine who live in Periwinkle-shells, in the same way that you do in yours?"

"No, I never met any of them," said the Hermit, greatly interested. "Do they really live in shells? How sensible! Even more so than the tube-making Worms, for there is less trouble in living in a ready-made shell than in making one for oneself."

"Most of them take empty shells," said the Siponcle. "Though some even give themselves the trouble of making caves in corals, which they line with smooth cement. For my part, I can't see why they should not be content to live like the rest of us. I think it is just a piece of vanity and affectation. They know that the *Mollusca* are of higher rank than we are, and so, in the hope of being mistaken for them, they adopt their habits and their cast-off shells."

"I cannot agree with your view," said the Hermit. "I should say they choose the shell because the protection is agreeable. I do not, however, see how they fit into the shell, which must be much too wide for them."

“They just build it up with grains of sand till it is the right size. They certainly make the cement very cleverly, and if they like the trouble, it is all the same to me,” answered the Siponcle.

“I never heard of creatures more reasonable!” said the Hermit. “I have often wondered that so few follow my example in making use of the empty shells so freely scattered about. But I *am* astonished,” said he, addressing the Urchin, “at your different relations. I have a great many, but there is generally some little likeness between us. How can you recognize your relatives?”

“We are all in some way *rayed*,” answered the Urchin. “Whenever you see those rays, either distinct as in the Star-fishes; in tentacles, as in the *Cucumaria*, the Anemones, and the Zoophytes; or even simply as lines down the skin, as in the Jelly-fishes, and in my family; you may know that you see a member of the class *Radiata*.”

The Hermit, hearing such learned talk, began to feel quite a respect for the Urchin, as he inquired,—

“May I ask where your rays are? I do not observe them.”

“The holes through which I put out my tentacles are arranged in ray-like lines down my skin,” answered the Urchin.

“Down your *shell*, you mean, don’t you?” said

the Hermit. "Your skin must be under your shell. By the way, how do you do about changing your shell when you grow too large for it? You cannot make it larger by adding to it as the Molluscs do, so you must change it. Do you not find your spines in your way when you do so?"

"I mean what I said; down my skin," returned the Urchin. "I have no shell, so of course I never change it. I could not exactly come out of my skin, you know."

"But it must be a shell, because it is hard and thick," persisted the Hermit. "And, besides, I have seen the shells of Urchins empty, and only those creatures which have shells can leave them empty. You never find the skin of a Fish or of an Anemone empty."

"There is something in that," said the Urchin, reflectively, "and yet I cannot see how it can be. I know my skin is outside of all, and Molluscs always have a skin under their shells."

"No, some Molluscs have a shell under their skins," said the Hermit. "But still, these shells, like the others, are always made larger by adding to the edges; and as your shell has no edges, I can't see how it becomes larger. Shells don't *grow* larger; they are made larger by their owners."

"My covering is not made as Molluscs make

shells : that I know," said the Urchin. "It is made in the way the Zoophytes make theirs, only it is a great deal better made, because I arrange my bits of lime in regular patterns, and they do not : I am very particular about that. Their sheaths grow as they grow, and my skin certainly does the same, for it always fits me perfectly. I think it is a skin : the Fishes, you know, have scales on their skins, and they never have any trouble about changing them. I think my covering must be something of that kind, only much stronger and harder. The Fishes do not need so much as I do, for they have bones under their flesh to keep them firm and steady, and I have nothing of that kind."

"Perhaps so," said the Hermit. "I know that wearing bones under the skin is a mark of high rank, and next to that I think is the wearing a solid shell outside, if you can't have bones. That is why I live in a mollusc-shell."

"That is it!" said the Urchin. "And I have a thick skin as the next best thing to a solid shell."

"But I can't tell how it grows larger," said the Hermit. "I have a thick skin on my claws, but after it grows hard it is a shell, and I have to throw it off when I want a larger one, and then wait till the new soft skin grows thick."

"My way is in some respects easier than yours,"

said the Urchin. "I dare say I should have to do the same if my skin was all one smooth piece like yours, but it is not so. All the thick part is in little hard plates, made of a sort of lime which I get out of the water. These plates are very small, and fit very closely to each other, being kept in their places by a very fine skin which goes all over them on the outside of all. When I want to make them larger, I add more lime all round the edges under the skin, which grows as fast as I want it. When I want to make the plates thicker, I add lime inside."

"How do you make the spines?" inquired the Hermit.

"In the same way as the plates," replied the Urchin; "the skin covers them too, and I add lime till I make them as large as I wish. Each plate is rounded off on the outside into a pearly tubercle, on which a spine is fixed."

"Of what use are the spines?" said the Hermit.

"They are sometimes of use in walking, and they are always of use as weapons: we can defend ourselves very well," said the Urchin.

"I think you must have a great deal of trouble with all your plates and spines. I have all my trouble at one time when I change my shell, and then I think no more of it," said the Hermit.

"Yes, you may be sure I am kept constantly

busy, seeing that everything is in perfect order; but, as I like to be active, it is all right," said the Urchin.

The Hermit looking at the Urchin more closely after this wonderful account of his skin, suddenly observed groups of little fleshy stalks, surmounted by three pincer-like points, which were in perpetual motion, as if snapping up some invisible objects and pinching them hard before letting them go.

"Why, you have claws too!" said the Hermit. "What funny little claws! What are they for? They are not near your mouth, as mine are."

"It is a special privilege of ours and the Starfishes to have these organs, which are not claws," said the Urchin, in a very mysterious manner. "What they are I cannot tell you. I am happy to give you information generally, but there *are* limits. You will excuse me if I remain silent on this point."

And he did remain silent, and has always been so, for no one can find out what these things are. Not even the wisest has been able to do more than give them a long name—*pedicellariæ*, or say more about them than that they are always found as above-described.

"So you think," resumed the Urchin, "that Molluscs are of higher rank than we are, because they have a solid shell?"

“It appears to me to be a sign of their rank,” said the Hermit; “and perhaps there may be something in their having their shells in one or two solid pieces. Your covering may be in so many pieces because you are lower in rank.”

The Urchin was not at all offended, and at once accepted the suggestion as a probable truth; whilst the Hermit added that he was very glad it had occurred to him, because it might be a reason why the *Mollusca* claimed higher rank than the *Crustacea*, who had their shells in many pieces. He understood that the *Mollusca* did claim this rank, but he had never understood why, for he did not feel himself in any way inferior to an Oyster, or even to a Whelk.

“Then why do you wear the shell of a Mollusc?” said a pert Periwinkle, who heard the remark.

“Because I find it convenient to do so,” said the Hermit.

“Don’t you think the power to make such a shell argues superiority over you who cannot do it?” said the Periwinkle.

“I don’t know that it does,” said the Hermit. “Most Crabs make very good shells, and I have heard from the Waves that the King-Crab, who does not live here, has a strong thick shell that covers him completely.”

“As if crab-shells could be compared with ours!” said a delicate little pink Cowry.

“Certainly they cannot,” said a Mussel, looking over the edge of the Basin, from a mud-bank, to which she and her family were moored. “Why I have in my shell at this very moment a Crab who makes his own shell, and who yet has to come to me for protection. I have plenty of room, so I take him in. It is a family custom of ours to do so, and of the Oysters and Cockles too. My stately cousin, the Pinna, is never without her red-eyed attendant.”

“That is only because the Pea-crabs are so small that it suits them to live in a thick shell,” answered the Hermit. “But they pay for their lodging by giving warning in case of danger, which their quick eyes can see before you see it. There is a Pinna settlement near my native valley, and I know that but for the Pea-crabs many a Pinna would have been devoured by the Cuttle-fish.” *

* It was anciently supposed that the Pinna and this little Crab entered into a sort of partnership, the Crab descrying the prey, and giving notice to the Pinna, who shared it with him after catching it. Modern naturalists speak slightly of this notion, but all agree that the Crab does live with the Pinna and some other bivalves; and they suppose that the movement of the Crab on the approach of danger, although a purely selfish one, may yet alarm the Mollusc, and cause it to close its valves, thus protecting both the inmates.

“As to making shells being a proof of rank, I don’t believe it,” said a Barnacle, attached to a floating piece of timber which had drifted into the Basin. “Our shells are made just in the same way as those of the Molluscs, and yet we are Crustaceans.”

“Quite true; and our shells are often mistaken for those of Limpets,” added some Acorn-barnacles, of whose conical white shells there were vast colonies all over the rocks, inside and outside of the Basin.

“But your shells are all in small pieces,” said the Hermit, who was not willing to give up his new idea.

“I don’t see how that can be of the slightest consequence,” said a Chiton, which had just appeared on the scene. “I wear my shell in eight separate little plates arranged on the top of my mantle, but I don’t see that I lose rank among the *Mollusca* on that account. I am none the less a true Gasteropod.”

The manner with which the Chiton delivered this last statement, as if in saying that he had said all that was possible, so excited the pride of the Barnacles that they could not let the subject drop, and they loudly expressed their opinion that there really ought to be some examination of the grounds on

which the *Mollusca* thought proper to give themselves such airs.

A family of *Serpulæ*, affixed to the shell of a large Oyster, now emerged from the recesses of their sinuous dwellings, and waving their beautiful scarlet fans in an agitated manner, declared that they too thought it high time that some steps were taken to put a stop to the arrogance of the *Mollusca*. They, the *Serpulæ*, as chief of the tube-making Worms, and therefore of all the Worms, would be glad to join with the other *Articulata*, as well as with any of the *Radiata* who might choose to come forward, in discussing any plan likely to promote the desired object.

The Sea-urchin and the Star-fish announced themselves ready to represent their class, observing that they regretted to see so little interest manifested by the Anemones, Sea-cucumber, and Siponcle. But they concluded that as these creatures could not make any pretensions to either shells or bones, they might suppose the question did not touch them, since it seemed agreed that the possession of a shell was a mark of distinction.

Here the Oyster suddenly opened his shell, and interposed in a decided and dogmatic manner, saying that in his opinion it most certainly was a mark of distinction, if you could not have bones, to have a

shell, a firm, solid substance that gave its possessor some weight in the world. Acting on this opinion, he himself always made a point of spreading his out as far as he could, and making the most of it, so that few Molluscs of his size could boast of anything like it.

“Then will you be good enough to inform us, why we, who also have shells, should not be equal in rank to the *Mollusca*?” demanded the Hermit.

“If you had allowed me to proceed without interruption,” said the Oyster, “I was about to add, that whatever may be the advantage of shells, the question at issue has nothing to do with them. I have listened to you, and have been amazed to find how much nonsense may be talked by creatures, of certainly average intelligence, when once they think they have found a grievance; but what could be expected better from those who make such a fuss about mere outward appearance!”

“It is all very well for you to talk in that way, who have such a plain, not to say ugly, shell,” remarked a gaily-tinted Scallop. “For my part, I think it matters a great deal what one’s shell or one’s mantle looks like.”

“Yes,” added an impatient Barnacle, “I think you will not find it very easy to persuade us that your shell is better than ours.”

“I might say, look at the lining!” said the Oyster. “Are your shells lined with pearl as mine is? Besides, you know you Barnacles can’t move when you once settle down. The *Mollusca* can all move if they like.”

“Can you and the Mussel move?” said the Barnacle.

“Why not?” said the Mussel, sharply. “If I choose to make myself secure in a comfortable place by spinning a silken rope, is that any reason why I should not break it, and move when I wish to do so?”*

“I agree with the Mussel,” said the Oyster; “at an early age, but still when I was quite capable of judging, I saw good reasons for attaching myself to the shell of a large Crab, in which position I enjoyed advantages not possessed by all Oysters, in being able to move about, whilst still pursuing my own settled occupations. After bringing me to the Basin the Crab died, but as he left me his shell, I am quite content, for my present situation is a very eligible one. I do not approve of erratic wanderings, but yet I consider the power of motion enjoyed by Molluscs as a proof of their superiority.”

* For a very interesting account of the way in which the Mussel spins its *byssus*, or set of threads, see “Glimpses of Ocean Life,” by John Harper, F.R.S.S.A.

“The Crab at least possessed that,” said the Hermit.

“You Worms are all fixed also,” said the Oyster, addressing the *Serpulæ*, and ignoring the Hermit’s remark. “And, moreover, none of your tubes can compare with those shells of *Mollusca*. We make our own materials, whilst you are content with anything you can find.”

“You are quite mistaken as far as we are concerned,” said a *Serpula*. “We most certainly make our own materials, and if other tube-making Worms use sand or bits of shell, they have all to cut them into shape, and to make cement to fasten them together. Besides, there are several families not at all fixed, though their tubes may be so.” Thus saying, the indignant *Serpulæ* all closed their fans, and went down again into their tubes.

“They need not have been in such a hurry,” said the ever-calm Oyster, “I was just going to except the *Serpulæ* family, who really make very good shells, scarcely to be known from those of a family of Molluscs, the *Siliquaria*. These latter, however, who are Univalves of good position, always begin with a few turns in the manner of other Univalves, though they soon get tired of that, and start off in eccentric fashions of their own, sometimes going to great lengths in all kinds of curves and curls. An-

other difference is, that as the *Siliquaria* like fresh air, they leave an open passage all the way up their tubes, while the *Serpulæ* are content to come to their doors when they want to breathe. If it was merely a question of shell," continued the Oyster, addressing the Urchin, "*you* need not be afraid to assert your claims, for your shell, though not quite like ours, may still deserve the name, and the making of it does you great credit. But in point of fact, the mere shell has nothing to do with real distinction. Some of the very highest Molluscs have no shells at all, whilst many others have them only in infancy, either throwing them off, or wearing them under their mantles when they grow older. The true difference between high and low consists, first, in having *good blood* in your veins, which in its way is very important; and, secondly, which is of supreme importance, in having *brains*."

"What in the world *does* he mean?" said the Urchin, confused by the Oyster's long speeches, and finally bewildered by his last assertion.

"There, that proves my position," said the Oyster, triumphantly, "if you had either of these, you would understand what they mean."

"*I* certainly understand you," said the Hermit, "the *Articulata* are not inferior in either of these points to the *Mollusca*."

“The *Annelida* are noted for their red blood,” said the *Serpula*, who, mollified by the Oyster’s explanation, had again come out of his tube. “I am not so sure about brains, but we are all graceful, and some of us beautiful, which is more than all Molluscs are.”

Not being able to contradict them, the Oyster took no notice of either of these speakers, but continued to address the still perplexed Urchin,—

“Of course, you don’t know what having brains means, for none of the *Radiata* have anything of the kind. They must, therefore, be of lower rank, though many of them are pretty enough to look at.”

“But still,” urged the Hermit, as the poor Urchin remained too much confounded to answer, “you have not shown why you pretend to higher rank than we can claim.”

“Answer me this,” said the Oyster; “Is not the Cuttle-fish the head of all Molluscs, and has he not the privilege of wearing bones inside his flesh, nearly as good as those of the Fishes? Has he not brains? Can you say that of the Lobster, or any of the *Articulata*?”

The Hermit could not say it, and not knowing what to say, he wisely said nothing, while the *Serpula* went down again into his tube, and corked himself up more tightly than ever, with the stopper

at the end of one of his tentacles, which served as a door when he wished for undisturbed seclusion.

The Oyster having thus figuratively and literally "shut up" his opponents, and secured the last word, proceeded to shut himself up in his own shell, to rest after his unwonted exertions.

There was a short interval of gloomy silence, broken at length by an expression, in rather strong terms, of the Hermit's opinion, that if the conduct of the Oyster was to be considered as a fair specimen of the use and influence of brains, the less one had of them the better, in a social point of view; an opinion which met with unqualified approval from the whole party: all agreeing that, even if the Oyster was correct in his facts, he need not have stated them in the way he did.

There was certainly a good deal of truth in the statements of the Oyster, as far as they went, but that was far short of the whole truth. There is no doubt that it is a very desirable thing to have *good blood* and *brains*, but the Oyster was mistaken in supposing that these are of necessity the *best* things possible. He might have seen that many creatures which had neither of these qualifications were nevertheless perfectly lovely to look upon, in grace and beauty; and *we* know, as *he* could not know, that there is a "grace" and a "beauty" of

priceless value, and often most shown by those whom the world would call wanting in the "birth" and "intellect" which it rates so highly. But, supposing that such knowledge were possible to the Oyster—as, however, it is *not*—how could he, shut up in his hard shell, ever learn anything of true or loving ways of judging his neighbours? But the poor Oyster could not be expected to know anything of this, so we are not so severe upon him as were the animals over whom he assumed so much superiority.

Whilst they were still moodily discussing the Oyster's demerits, a new speaker appeared on the scene, in the person of a Fish, of mild and venerable aspect, who came out from under the shadow of the rock, whence he had watched the whole of the proceedings with fixed attention. As he now turned his large contemplative eyes upon them, the assembly felt for him all the respect due to his superior intelligence, without any of the alarm so often felt by the lower marine creatures for the Fishes, who are, for the most part, very unscrupulous in the use of the advantages given them by their rank and strength.

"I think," said the Fish, "that, if you will allow me, I may be able to throw a little light upon the point in debate, which is really as clear as calm water, if you could but see it."

“I have eyes,” said the Hermit, who thought that the Fish was classing him among the *Radiata*, many of whom are quite without these useful organs.

“They are sufficiently prominent to render that statement unnecessary,” replied the Fish, in his deliberate manner. “But it is not enough to have eyes; they must be constantly used, or they are of little service to you. Perhaps the Oyster might have made fewer mistakes if he had not lost the use of his eyes, by fixing himself down to one position in a hard shell as he has done. In his infancy his eyes were as good as the best, but since he settled down he has quite lost the use of them.”*

“Can the Oyster really move?” inquired the Hermit.

“Not now: never after he once makes a final settlement. The Mussel, however, can break her threads and move if she desires it; but she is generally content to remain in one spot with her family around her,” answered the Fish.

“Have they really any right to look down on us?” said the Hermit.

* Young Oysters, as well as other Molluscs which are fixed in later life, have eyes whilst in the free and swimming state, which are gradually lost after the animal has permanently settled itself down.

“ The Oyster makes a mistake common to narrow intelligences,” replied the Fish, in a meditative manner. “ These being, from their very limits, unable to grasp that which is beyond them, are unconscious that there is anything larger than themselves ; and thus it is that the Oyster, having his own small share of brains, or what answers the same end, and knowing that it is a privilege to have them, appropriates to himself all the distinction and honour enjoyed by those who have a full share. Now, although the higher *Mollusca* have a share only second to that possessed by the Fishes, this does not apply to the lower members of the kingdom, among which are the Bivalves, the class to which the Oyster belongs. It is quite certain that these are not of higher rank than the *Crustacea*, even if the higher *Mollusca* may be so. The *Radiata*, for the most part, must be content with a lower position than either of these, but still have their own place, and it is a very important one.”

“ Is the highest Mollusc equal to a Fish ? ” said the Hermit.

“ Certainly not,” returned the Fish. “ The least Fish has a true backbone, and is therefore of higher rank than any creature not possessing this privilege. Even the highest *Mollusca* only have

something *resembling* a backbone, and not a true backbone."

This explanation, given, as all truly valuable information is always given, without any selfish assumption of superiority on the part of the giver, satisfied all the party, and harmony was again restored. The Urchin consoled himself by thinking that the vexed question of "skin *versus* shell" need no longer trouble him, and he was satisfied that, as far as appearances went, he had no cause to complain. He even ventured to suggest that perhaps, after all, he might happen to have good blood in his veins, since some of his relations were so closely connected with the *Annelida*, who all had it.

The Star-fishes took a purely practical view of the case, concluding that the mere possession of brains was not enough in itself, if they did not serve to protect their owners from common dangers. In this they alluded to their own well-known practice of insinuating themselves into the shells of the Oysters, and of devouring those sapient Molluscs, who, with all their pretensions, had not wit enough to defend themselves from these attacks.

The *Serpulæ* emerged from their retirement without the least trace of their recent depression about them, having already forgotten all about the grievance. Theirs was not a nature that could long feel any

trouble, so fully satisfied were they with the delight of existence, and with the joy of their own loveliness; a joy in beauty for its own sweet sake, and not for any admiration its possession might bring to them, for of that they never thought.

CHAPTER IV.

THE Barnacles, however, were not so easily satisfied. They felt severely the blow which their vanity had received, and lamented sorely that they had ever given up the free, joyous life of their infancy. Why, they asked, could they not have remained content with the life of gay activity which they then enjoyed?

The *Balani*, as the Acorn-barnacles are scientifically called, did not at all agree with this opinion, and considered their cousins were much too restless in their ways. This, they supposed, must arise from the fact of the Barnacles being attached by a long stalk, instead of being fixed, as they themselves were, immediately to the rock or wood: so much swaying to and fro evidently tended to give unsettled notions.

“As to the superiority of the Molluscs,” said one of the largest of the *Balani*, “it really seems to be very uncertain, and I think we should

be foolish to trouble ourselves further about it. We Balani are, to all appearance, quite as good as the Limpets, who are certainly highly respectable Molluscs ; if, indeed, we have not some advantage over them ; for they, having their houses on their backs, can only peep out under the roof, whilst we have a proper door at the top of ours, whence we can look out in all directions."

The Limpets protested against this conclusion, and one of them said that if they had wanted such a door they might have had it, for some half-cousins of theirs, the *Fissurellæ*, all had it, and some relations of the *Fissurellæ*, the family of *Haliotidæ*, or Ear-shells, had quite a row of windows in their roofs. These were at the same time able to look out from below, and to move where they chose, which was more than the Balani could do.

The Balanus expressed his wonder that the Limpet made so much of that point, considering that he cared so little to avail himself of the privilege, being of such decidedly stay-at-home habits.

"I am sure it would be better," continued the Balanus ; "since you move so seldom, if you were fixed as we are. Come what may, we are always safe and secure, whilst if any danger threatens you, there is nothing for you but to cling to the rock with might and main, at great cost of effort. Why,

you even make deep holes in the rocks with your clinging !”

The Limpet replied that there was no difficulty in making holes in the rock if you went often enough over the same spot.

“I like,” said he, “to have a fixed place to which I can return after my rambles, and so I mark it by making a hole. But you are mistaken about the clinging. We can cling very fast, but, when we wish to be secure, we fasten ourselves to the rock by a strong glue, which we are skilled in making, and then have no trouble of any kind. I should be sorry if I could not take my nightly walk in search of fresh grass—my food, you know, never comes to be caught in nets as yours does, even if I had a net ; but I have not, and I am glad of it, for I like change of scene.”

The Balani, who were particularly proud of their skill in fishing, were not pleased that the Limpet should prefer his own way of living, and as is not uncommon in all society, they were not disposed to admit that they were beaten in argument ; so, with some slighting remarks as to the value of grass as food, they pretended it was dinner time, and that they must therefore spread their nets, instead of idling and talking. They threw open the folding doors in their roofs, and stretched out their nets,

which were in fact their own hands. Beautiful nets truly! the long, glistening, delicate fingers, spread out in all directions, closing over the minutest objects, which were then transferred indoors to the mouth of the patient fisher. It was so beautifully and cleverly done, that one could really excuse a little pride on the part of the Balani.

The Hermit remarked that it was certainly preferable to have the power of movement from place to place, but still, having a fixed home had its own advantages. He thought that the Barnacles, in fixing themselves to floating objects, managed very successfully to combine all advantages.

The Barnacles were immediately consoled by this view; and, being thus restored to their usual light-hearted gaiety, began to talk of their travels, which had been very extensive.

“You see,” said the most talkative of the family, “that as we always choose, when circumstances permit, to fix ourselves to a Ship or some other floating object, we see a great deal of the world.”

“But you are always so near the surface,” said the Hermit. “Is there any society there except the Waves and the Sunbeams?”

“Society!” echoed the Barnacle. “I should think so! To begin with, there are all the Jelly-fish family: if you saw them you would not think

of any want of society! Then the Molluscs of highest rank live on the surface as much as they do in the depths; all the *Cephalopoda*, that is, the Cuttlefish and his relations, are to be found there."

"It is to be hoped that his relations are better looking and more amiable than he is, or else I think society would be better without them," said the Hermit, dryly.

"The Nautilus, who is a cousin of his, is the most beautiful of all the Molluscs, making the most delicate shell, of which he is not a little careful, for he constantly keeps it covered with a pair of loose wide tentacles, for fear of accidents. He is a clever fellow too, for he can both swim on the surface and walk on the bottom of the sea. For swimming, however, none of them equal the Calamary, or Flying-squid, who can even leap far out of the water."

The Barnacle was now perfectly happy, for he had found a good listener, and there was nothing he liked so well as to talk of his experiences and his travels.

"Do any other Molluscs live up there?" inquired the Hermit.

"Not many of the *Gasteropoda*," replied the Barnacle. "They are good walkers, but few of them can swim. The purple *Ianthina* is an excep-

tion, and is very fond of being on the surface. The most curious thing about her is the care she takes of her eggs. Not liking to trust them out of her sight, she makes a little raft for them, and carries them with her wherever she goes."

"That is a great deal of unnecessary trouble, I think," remarked the Hermit.

He had never been accustomed to see any consideration for their young among mother-crabs, who are quite destitute of maternal feeling, so he did not find anything to admire in the conduct of the *Ianthina*.

"But," continued the Barnacle, "there are two classes of Molluscs who properly belong to the surface, the *Heteropoda* and the *Pteropoda*."

"I never heard of them before," said the Hermit.

"They are the lightest and the most graceful of all the Molluscs," said the Barnacle. "The *Heteropoda* swim with their foot, which is more like a fin; but the *Pteropoda* have two wings, and swim with these, as the Gulls and other air-creatures swim in the sky. I think that is the very perfection of life, to dance and sport on the surface like the *Pteropoda*; just what I enjoyed in my young days, before I was foolish enough to settle down!" and the volatile Barnacle paused with a regretful sigh. But he was soon himself again, and continued:—

“These are all very small creatures, but the large creatures are almost as numerous. There are all the Fishes, and then in most places there are the Gulls and some other air-creatures, who spend much of their time on the surface. Since our log has been free we have had a great deal of their company. They rest on the log and talk with the Waves. That is a grand treat, I can tell you, to listen to these talks.”

“Do they tell the Waves all their land-stories?” asked the Hermit.

“Yes, a great many of them; but the Waves hear stories from everyone!” said the Barnacle, with enthusiasm. “The Breezes know the most land-stories, but the Rivers also learn a number, which they bring home to the Sea. Do you know how the rivers set out on their travels?”

“No,” said the Hermit; “I should like to hear about it.”

“Well, then,” said the Barnacle, “at first they are only little water-drops, and the Sunbeams draw them up out of the sea, and carry them up to the great white Clouds which live in the sky. There they are nursed till they grow large and strong, and then the Clouds, with the help of the Winds, take them far away to the hill-tops, where they gently let them fall to find their own way back to

the sea. They know they are sure to find it, and to take new and beautiful stories home to the Waves. Sometimes they find the way very soon, before they have grown much, and then with what glee do they dash into it, often leaping from the high cliffs in their eagerness! But very often they wander on and on, now under the earth, now over it, growing and growing till they become great Rivers. These when they find the sea at last are just as joyous as the Streams, though they roll quietly in instead of dancing and leaping. The Waves told us all about it," concluded the Barnacle, "and they tell us endless stories as they carry us about the world."

"It is a charming story," said the Hermit. "I must ask the Waves to tell me about the Rivers. I wonder if I could go to the surface. Do you ever see any Crabs there?"

"Oh, yes; the swimming Crabs are often there, and besides these there is a family which never go to the depths at all. They live constantly on the floating weed,"* answered the Barnacle.

"Is there much weed on the surface?" said the Hermit.

* The *Grapsidæ*, a family of Crabs which make their abode among the *Sargosso*, or gulf-weed. See Prof. Bell's "Hist. of Stalk-eyed *Crustacea*."

“In some places it is very abundant, and of a kind that you do not find in the depths,” said the Barnacle. “It is not fixed like the common weed, and it spreads far over the surface, affording a home for numerous creatures.”

“I should really like to make a journey to the surface,” said the Hermit; “but I am afraid my shell is too heavy, and I cannot go without it. I suppose one cannot have every advantage, however, and on the whole I would rather have my own life in the depths than be like the Crabs you mention.”

The Barnacle had no suggestion to offer as to the means by which the Hermit might attain his object, though he assured him that a journey to the surface would quite repay him for any exertion it might cost. He said that he himself had tried both the depths and the surface, and decidedly preferred the latter as a permanent home.

“Have you not always been fixed on your stalk?” inquired the Feather-star, who had advanced within speaking distance, and was looking with interest at the Barnacles.

“Oh, no!” said the Barnacle. “When we were quite young we were free, and swam as well as any one. Ah, what a life that was! In our earliest infancy we looked just like other little Crustaceans, and were covered with a shell like theirs. We had

legs too, and a forked tail, as well as two pairs of long feelers on our foreheads ; we had only one eye, but it was a very large one and was as much as we needed then. After we grew tired of that dress we had another, quite different, and quite as odd. Then we thought we would try what a bivalve shell was like, and then we had two great eyes, for our heads were grown nearly as large as the rest of our bodies. After this we grew tired of change, and determined to settle down, so we glued our long feelers to the bottom of a Ship, threw away the bivalve shells, and put on these which we now wear. Legs were no longer of any use, so they changed into arms fitted for fishing with : the eyes, too, were put away, for it was useless to look at the Ship, and, as we had fastened ourselves by our feelers, there was no other direction in which we could look.”*

“ After so many changes it is no wonder that you should enjoy a roving life,” said the Hermit. “ How does it happen that the Balani are so much quieter in their tastes than you are ? ”

“ Perhaps they settle down so completely at first that they forget the past. We, being able to move

* Mr. Gosse's “ Year by the Shore,” *Good Words* for Nov. 1864.

on our stalks, keep a clearer remembrance of those merry infant days," said the Barnacle.

"What remarkable differences society presents to us," observed the Feather-star. "You, for instance, were free in infancy, and fixed yourselves down only in later life, whilst I, being at first rooted to the rock as firmly as the Zoophytes, was never content till I succeeded in detaching myself from the end of my stalk and floating away free."*

"I think it must be best to have one's choice, either of rest or motion," said a rather conceited Terebella, one of the tube-making Worms, who, having just put the finishing touches to a new tube, was indulging himself with a short swim by way of refreshment.† "That is *my* plan, and I think it a good one. My tube is always fastened firmly to the rock under the sand, though part of it comes out into the water, but I can move in and out of it, and I always take care to leave my back door open, so that I may escape if attacked in front. When I want to be quiet I can live in the lower part, though I spend most of my time at the front door. You see it is a great convenience to have plenty of

* Prof. Forbes' "Hist. of British Star-fishes."

† "Aquarium," page 224. "Common Objects." "Glimpses of Ocean Life."

room, and I always make my tube several times as long as myself."

"And you really make your tube yourself! How do you do it?" said the Hermit.

"With bits of shell and sand, or anything I can find, fastened together with thick cement which I make. This soon hardens into a firm tube. Some of my brothers use more sand and stuff than I do, and make more solid tubes; but I don't see the use of making such good cement if it is not allowed to show, so I don't put the materials so thick as to hide it completely. I enjoy doing it, and I flatter myself that those small tubes at the entrance, for my tentacles, are very neatly finished off!" said the Terebella, with an air of considerable, but very justifiable, satisfaction.

The Hermit fully agreed with this, and inquired if there were many Worms which made tubes.

"There are four families who all make different tubes, besides the Siponcle, who is not a true Anne-lid, and who only finishes off a Mollusc-shell to fit him. The *Serpulæ*, whom you know, are the head of the race, and make real shell-tubes. They are distinguished from the *Sabellæ* principally by having a stopper at the end of a tentacle, with which they can quite shut up their tube. The tubes of the *Sabellæ*, too, are of different kinds, and are usually

built up of cement and grains of sand, or of little round bricks which they make of mud. Sometimes their tubes are made of cement alone, and then they look only like skin. My own family comes next, and then the *Amphitrites*, who burrow in the sand. Their tubes are very beautifully made, and they themselves are worth looking at. Ah! here is one of them. Allow me to introduce my cousin, the fair Auricoma, quite a belle, I assure you!"

At a short distance from the learned little builder lay a tube, rather wider at one end than the other, perfectly round and smooth, and formed of single grains of sand fitted closely to each other. From this, as he spoke, emerged the fair resident, coming quite far out, the better to observe the Hermit, who, as he looked at her, thought the Terebella had good grounds for the opinion he entertained of her. It was certainly a good feature in the Terebella that he was not jealous of the superiority of her tube; but then most animals are too well satisfied with their own performances and possessions ever to make comparisons unfavourable to themselves.

The fair Auricoma was of medium size, and was very well proportioned, not being so thin as many of the *Annelida*. Nothing could exceed the delicacy of her skin, through which the course of the blue veins might be distinctly traced. Very marked

was the abundance of her hair, of a varying shade, at times of brightest gold, and so luxuriant that it not only covered her neck, but was gathered in clusters down the whole length of her body. A pair of golden combs formed her chief ornament, and sparkled brilliantly as she bent her head in response to the greeting of the Hermit. The latter was dazzled by the appearance of the delicate little beauty ; but he soon collected himself sufficiently to express his admiration of the skill shown by her in making so perfect a dwelling.

The fair Auricoma, though she looked among the humbler *Annelida* like the finest of fine ladies, had still no fine-ladyish horror of acknowledging to being useful. On the contrary, she was extremely proud of her skill in using her tentacles, and began at once to describe the way in which she proceeded, saying,—

“ I choose the smoothest grains of sand, and those that are brightest and clearest, and, having arranged them neatly with my tentacles, I cement them into their right places. Sometimes, also, I take bits of coloured shell or stone, clipping them first carefully to the right size and shape, for I can't bear anything out of keeping. The *Terebella* laughs at me for taking so much trouble, but I can't see why, when one is about it, one's work

should not be beautiful as well as useful. I could not exist in a disorderly or an ugly dwelling."

"I have not time to attend to those considerations," said the Hermit. "I never thought it mattered about the outside if the inside was comfortable."

"But why not have all beautiful as well as comfortable?" said the Auricoma.

"I don't know why not," said the Hermit. "It must be a matter of taste: the Prawn talks as you do, and I daresay it is all true, but I never thought about it much. Those are pretty things on your head; are they of any use?" he continued, looking at the gold combs.

"You mean my combs? Yes, indeed, they are of use! Can you guess in what way?" said the Auricoma.

"Not in the least," said the Hermit.

"When I burrow in the sand," said the Auricoma, "I always go down head first, and I use these combs to shovel the sand out of the hole I am making, throwing it over my head behind me."

"Don't you find that having that tube on your back makes it difficult for you to burrow?" said the Hermit.

"Not at all," said the Auricoma. "It does not interfere in the least with my working. It lies

quietly on the sand till I make a hollow ; then as soon as that is large enough, by leaning out of the mouth of the tube I overbalance it so that it falls into the hole in an upright position, and I go on quite easily till I am quite buried.”*

“What a most singular taste that is of burrowing in the sand!” said the Hermit. “I never could see anything in it.”

“I find it delightful,” said the Terebella. “I can swim or walk, in the water and on the sand, and I find that burrowing makes a most agreeable variety in my pleasures. Some Worms live entirely in the sand or mud, but that I do not think desirable.”

“No, I should say not!” said the Hermit. “I have met in my travels with many Worms, very different from each other in appearance, so I suppose you have a very large circle of relatives?”

“I should think I had!” said the Terebella. “No end of them, as I really believe, for I am always meeting with some new cousin. Some have tentacles, some have not ; some have heads, some have not ; some have scales, some bristles, and, in fact, I scarcely know what they have or have not. The tube-making ones are the most distinguished,

* For a full description of the *Auricoma* and its mode of burrowing, see Mr. Gosse’s “*Aquarium*,” page 227.

that is one comfort. The Lug-worm belongs to a good family, and he tries, poor fellow, to imitate us; but he can't do anything more than make coils of sand, which look something like tubes, but which are of no use, and fall to pieces if they are touched."

The Terebella, we may remark, is here very unjust to the Lug-worm, which never thinks of imitating anybody, but merely adopts a neat way of arranging the sand which he forces out as he makes his burrow. The Earth-worm disposes in the same way of the earth from his hole.

"I have heard," observed the Barnacle, "of a Worm living in fresh water, who, from the description, would seem to resemble you in some degree. He makes precisely the same kinds of tubes of small stones, or bits of shell, or sand, and sometimes he even uses the shells of very small fresh-water Mussels and Snails, even when these are still occupied by their owners; whose permission he never asks, but coolly makes them his prisoners, dragging them about wherever he may choose to go."

"Has he tentacles like mine?" asked the Terebella.

"I believe not," answered the Barnacle. "I think he has feet like the Crabs but without claws, and these he puts out of the front of the tube, which is held firmly on with two hooks behind."

“I never heard of a Worm with feet,” said the Terebella.

“But the oddest part of his history is the changes he makes, which, being as great as those I have made myself, interested me in him at first,” continued the Barnacle. “After a while he gets tired of his tube, so he fastens it securely in one place, shuts up both ends, and in this retirement makes himself an entirely new dress. When he has nearly finished this work he leaves the tube and swims to a dry place, where he spreads out his new wings, and goes up away into the air, bidding the water farewell for ever.”*

“Well, that *is* strange,” said the Terebella. “But I don’t think he can be a relation of mine: I never heard of any of my family doing anything so silly as to leave a good tube when they had once made it, or to leave the water and sand for the air. I never would do that.”

“It is very difficult to know all one’s relations,” remarked the Hermit. “But yours, I suppose,

* The *Larvæ* of the Caddis-flies, known as Caddis-worms. The Terebella is correct in disowning any relationship with these Worms, which belong to the division *Insecta* of the sub-kingdom *Articulata*, of which kingdom, however, the *Annelida*, or Worms, form another division.

may be known generally by their long, thin bodies ; all the Worms I know are alike in that respect."

"There are a good many exceptions to that rule, though it is generally true," replied the Terebella. "The Leaf-worms, for instance, are quite flat and round. Comical creatures they are too! They don't in the least mind being cut up into the smallest pieces. Each piece becomes a new Worm, that is all!"*

"And a good deal, too!" said the Hermit. "Nothing short of devouring them entirely can do them any harm."

"Just so," said the Terebella. "These creatures are, however, not true *Annelida*. We are in every way superior to them, though some of us, too, can afford to lose a segment or so without feeling the loss. The family of *Naididæ*, who live in the mud, can always grow a new head or tail if they chance to lose either, a privilege worth possessing, because creatures without tubes are never secure from accidents.† Not, however, that one is always

* Mr. Gosse's "Year by the Shore," *Good Words* for May 1864.

† Mr. Lewes, in his "Seaside Studies," gives an account of an experiment of his with two Naids, which each reproduced *two* new heads and *two* new tails, having thus been *four* times deprived of half their bodies. A *fifth* division proved fatal.

safe, even with a tube, as we sometimes find to our cost, through another member of the family to which the Leaf-worm belongs, the *Planaria*; we are extremely glad that he is no near relative of ours, as he would be a complete disgrace to any respectable family, though, in fact, he is one of the best of that set of Worms, who, with a few exceptions, show such a shocking want of proper spirit that they actually live upon, or rather in, other animals instead of providing for themselves. But about the one of whom I was speaking: do you see that long sprawling creature there?"

"I see a very long twisted piece of sea-weed," said the Hermit.

"No; it is a Long-worm—hideous monster!" said the Terebella. "He likes nothing better than to put his horrid head into our tubes and drag us out and devour us!"

"Perhaps he does not know he is doing any harm," said the Hermit, who did not appear to be properly shocked at this atrocity; perhaps his sensibilities had been blunted by what he had seen amongst Crabs, who are not noted for tenderness of feeling, even to their own relations.

"Yes, he does," said the Terebella. "There are creatures enough that would do for him, without coming to us. Only to-day that very wretch

made a dart at a solitary Sabella, like the one with the splendid crown of tentacles which you see on that Scallop-shell, and, before the poor thing could escape, snapped off his crown. The poor fellow will have to live in the back of his house a long time before he can get another crown and be fit to be seen.”*

“Extremely unpleasant for him, certainly,” agreed the Hermit.

“There is also a true Annelid, who is neither round nor thin, by name *Aphrodita Aculeata*. You would not suspect her to be a Worm, would you?” said the Terebella, as he pointed out a Sea-mouse, who happened to be taking a leisurely walk in their direction.

The Hermit was not at first attracted by her appearance, for she was so covered with fine mud that even he, careless as he was, remarked, “What would the Prawn or the Auricoma say to that?” But on looking closer he was struck with the brilliancy of the fine, silky hairs which clothed the sides of the *Aphrodita* with a garment of wondrous hues.

* Mr. Gosse, in his “Devonshire Coast,” mentions a Sabella which, having by some accident lost his tentacles, retired into his tube, and, after some time had elapsed, came out with a new set.

He knew nothing of rainbows, or he would have compared her to nothing less lovely, as the shining hair gleamed with every shade of colour.

“Her hair is really finer than that of the Auricoma!” he exclaimed.

“Is it not a pity she does not take better care of it?” said the Terebella. “But she is quite regardless of her appearance. And really one must confess that her tastes are rather low, for she always chooses to live in the mud, quite throwing herself away. If she took more care of herself, and came out into the light, we should be able to see her much better. She is very unlike the Auricoma.”

“Is she as clever as the Auricoma?” asked the Hermit.

“Oh, no, nothing of the kind,” said the Terebella. “On the whole, the Aphrodita is rather stupid: she seldom does anything. She is not very good-tempered either, and would you believe that all those beautiful hairs are really dangerous weapons in disguise?”

The Hermit looked very much astonished, as indeed was very natural, for one does not every day meet with so strange a combination as the Aphrodita,—a beauty utterly regardless of her appearance and personal habits; and a beauty, moreover, armed with dangerous weapons. Wonderfully curious are

these weapons, according to Mr. Gosse's account of them. They are numerous, very varied in shape, and very fine and delicate, looking as if made of the clearest glass. But they are so tiny that it is difficult to think they can be intended for use, however formidable they may seem.*

Well," said the Hermit, after he had watched the Aphrodita till she was quite out of sight, "I shall never cease to be surprised at the variety which may exist among the members of the same family. Your relations are almost as varied as those of the Urchin. Mine, too, are very numerous, and I have heard of several new ones since I came to the Basin."

But the Terebella, who, like many other good talkers, preferred to hear himself rather than any one else, was not disposed to hear about the Hermit's relations, so he suddenly remembered that it was time for him to return to his tube, which he accordingly did with his usual activity of movement, after bidding the Hermit a cordial farewell.

* In Mr. Gosse's "Shores of Devon," there is a very striking account of these curious weapons, which are possessed by a very large family of the *Annelida*.

CHAPTER V.

THE Hermit, being thus left to his own resources, looked round for some one else to whom he might talk, and seeing a pretty Crimson Anemone expanding her tentacles in a leisurely way, which seemed to say that she was not particularly busy, he addressed himself to her, inquiring, by way of commencing the conversation, if she had been long in the Basin.

“Yes, for some time now,” answered the Anemone, politely waving her tentacles as she turned to him. “I am not, like you, fond of travelling ; and when I find a nice place I generally settle down and stay as long as I can. There are few things here of which I could complain.”

“There seems to be no want of society,” remarked the Hermit.

“Oh, no,” said the Anemone. “If anything, we have too much. But, with so many of my relations as there are, I find it very pleasant.”

There were indeed great numbers of the *Actinia*, or Anemone, family scattered over the Basin. In one deep fissure, which widened into a dark cave, was a colony of *Troglodytes*, or Cave-dwellers, who never come out into the light. Nearer to the edge of the Basin, but still in deep shadow, were many of the *Crassicornis* family, largest and most gorgeous of all the *Actinia*, matching the Dahlias amongst flowers. They have a wide low column ; in colour, light-green, olive, or deep-green, or purple crimson, splashed and streaked with crimson or scarlet. The disk is equally varied, and is edged with short, stout, conical tentacles, which may be white, with pellucid rings, deep crimson, or of the highest flush of rose, with a broad ring of lilac. Farther out into the light were the beautiful *Dianthia*, or Plumose Anemones, whose massive columns are often some inches in length, olive, pale rose, or snowy white in colour, and crowned with innumerable delicate fringed tentacles, spreading round a deep-orange centre. You could scarcely believe the *Dianthus* to be anything but some rare and exquisite flower. Then, again, were many of the Daisy Anemones—small, delicate, brownish-grey in colour, with fewer tentacles ; and noted, like their floral namesakes, for loving the sunbeams, and choosing sunny positions, being, of course, always careful to keep under water. I can-

not mention all the varieties, but these are among the most striking.

As the Anemone pointed them out, with a little excusable pride, to the Hermit, she said,—

“ You see that my cousins and I are almost as unlike each other as you, and the Crab, and the Lobster.”

“ I hope you agree better than we do,” said the Hermit.

“ We agree perfectly,” said the Anemone. “ We never think of really hurting each other. Sometimes, as happens in all large families, we have little squabbles, but never of much consequence. The *Dianthia* are admitted to be chief in importance amongst us ; and, as they are amiable enough, we never dispute about rank or anything of that kind. We *Mesembryantheums*—that is my own family name—are lowest of all, but still I don’t think we enjoy life less than the others ; and, if we are not so beautiful as the *Dianthia*, we still have some attractions of our own.”

With this opinion the Hermit of course agreed, as in common politeness he was bound to do. He could, however, do so with all truth, for the Anemone was a lovely creature. In colour she was of clear, deep crimson, and she was ornamented with a brilliant turquoise necklace, having a spot of blue at the root of each tentacle.

“This is probably a relation of yours,” said the Hermit, looking at a *Lucernaria*, attached by its base to a stalk of sea-weed. It was small, but very lovely ; in shape like a bell-flower, with eight little clusters of orange-tipped tentacles, arranged at equal distances along the edge of the bell.

“It is rather a distant relative,” replied the Anemone. “A sort of half-cousin, more nearly related to the *Medusa* family than to ours, but connecting us with them. Do you know any of the *Medusæ*?”

“Jelly-fish, are they not?” said the Hermit. “They are light and delicate, and some of them have long arms like yours. I have sometimes seen them, but they do not often come to the deeps where I live.”

“No, they generally swim on the surface. They do not settle down as we do. At least they do not settle down as a rule, though some of them are quite fixed all their life. The children of a free, swimming *Medusa* always settle down ; but the children of these again are free and swimming, and thus they go on, one generation fixed and the next free. A *Medusa* never has a daughter like herself, but her grand-daughter is so. It is quite peculiar to the *Medusa* family, and is, I think, a most singular arrangement,” said the Anemone, who had become quite communicative and confidential.

“Very much so, indeed,” said the Hermit, as he took a leisurely survey of the Basin, observing, after a pause—“By the way, amongst the many advantages of the Basin, has it that of being well provisioned? How do you do for food?”

“Perfectly well,” replied the Anemone. “Our friends the Waves take good care of us, and bring us all kinds of nice things. Besides, there is plenty of live-stock among the sea-weeds and in the hollows.”

“I am glad to hear that,” said the Hermit, “for the journey and the change of water and scene have given me an appetite. Why, how fortunate,” continued he, as he perceived a piece of fish which had previously remained unnoticed, “here is some fish provided for me by my kind friend the Wave! With your permission, I will refresh myself with a little of it.”

As the Hermit proceeded to dine, detaching neat little pieces of fish with his claws, the Anemone was struck with a curious incident, which was repeated several times before she could believe it. A bright, pretty Worm, striped with the same colours as those on the claws of the Hermit, darted its head from under one of these claws, and, boldly snatching the morsel which was on its way to the Hermit’s mouth, disappeared as quickly as it had emerged.*

* “Aquarium,” page 156.

“Dear me, what can that be?” she exclaimed, when fully convinced of this fact.

“Oh, nothing,” calmly returned the Hermit, as he picked up another piece of fish; “it is only a Nereis, which lives in my shell! I did not want to bring him on so long a journey, but as there was room enough I could not refuse him. He keeps himself quiet, and does not disturb me. The shell is large enough for us both.”

“Really,” said the Anemone, still more amazed, “I wonder you don’t feel tempted to eat him.”

“To eat him!” repeated the Hermit, marvelling at such a proposition from so fair a creature. “Certainly I never think of such a thing.”

“And then you so quietly let him take your choicest bits out of your very mouth!” said the Anemone.

“And why not?” said the Hermit. “He does not eat much, and I can always get enough for us both. The poor fellow has no shell of his own, and indeed he is too long and thin to find one that would do, so he naturally feels himself most comfortable with me.”

The Anemone was too much astonished to say anything more till the Hermit had finished his repast, which, in spite of his general politeness, I regret to say, he did without offering her a single

morsel. It is to be hoped that this arose only from the thoughtlessness to which is due so much of the want of consideration which exists in the world. It will be remembered, too, that he was very hungry. In a short time he again addressed himself to the Anemone, asking her what kind of food she preferred.

“I am not at all particular,” said she, “though I do prefer to have large animals killed before I eat them. But then I only absorb the essence or juices of my food. I can live for a long time simply on water, particularly if it has in it small animals, or the seeds of sea-weeds. I always drink large quantities of water : it is so very nourishing.”

“Perhaps it may be so, but I should not have thought any one could live on water alone,” said the Hermit. “For my part I like solid food, and I can eat almost anything. This is very convenient, especially when I am travelling. You said, I think, that you were not fond of travelling. I am rather surprised to hear it.”

“Well, it is such a trouble to move about often,” replied the Anemone, “I do not like exertion ; but I do occasionally take short journeys when they are easy ones. Once, indeed, I had a long and dreadful journey, which has made me less disposed than ever to move. I was quietly amusing myself one day in

a small rock pool, where the Waves had left me to await their return, when I suddenly felt myself seized by a monster, immense beyond description, and as frightful as it was huge. I of course drew in my tentacles, and shrank into the smallest space possible, and I knew no more till I found myself in a strange place—possibly a pool, but unlike any pool I ever saw. If I had not great powers of endurance I must have died from fear, and from want of fresh water. The pool was crowded with animals suffering as I did, and it was constantly surrounded with monsters of the same kind as the one which had seized me. To what end I know not, but these monsters were always putting things into my tentacles, which I took in till I was tired, often without gaining the smallest nourishment. The only comfortable meal I had consisted of a Crab and a Shrimp, brought from the same pool as myself, and which unwarily came within my range.”

The Hermit moved a little farther from the Anemone, with the mental reflection, “So my fair friend eats Crabs and Shrimps, does she?” But aloud he said,—

“What a position to be in! How *did* you escape from it?”

“I cannot tell how, but after being nearly dead, I felt myself again seized; and then, after another

period of unconsciousness, I found myself, to my intense joy, once more in the sea. I threw myself on the kindness of the Waves, begging them to take me to some secure place. They brought me to the Basin, and here I hope to remain in peace."

The Hermit expressed due interest, and then related his own adventure with the boat, concluding by saying,—

"It is indeed strange that after such adventures you and I should meet. I cannot doubt but that the monsters who seized you were also men, in some form."

"You cannot wonder if, after such an experience, I should have no desire for travelling," said the Anemone. "Of all the other Anemones the Anthea are the most active, but most of them care less about moving than I do. The Troglodytes never come out at all."

"Indeed!" remarked the Hermit. "But there are some Anemones which must like to travel. One kind make a practice of settling on the shells of Hermit-crabs, and we are noted for our activity."

"It is still on the same principle," returned the Anemone. "Though they may like the pleasures of travelling, they do not like the fatigues, and by living with you they get the one without the other."

"Well, it is not a bad idea for *them*," rejoined the Hermit, good-naturedly. "*We* do not always

like it as well. I don't mind occasionally having an Anemone on my shell ; but, when I am going on a journey, I don't always like to be obliged to take it with me. I lived for a long time with a Parasitic-anemone ; that is, I lived inside the shell, and he lived outside. We agreed very well as long as he was young and small, but at last he grew so fat and heavy that it was quite a labour for me to move. This did not suit me at all ; so, when I could bear it no longer, I gave him notice to quit. But, as I could not get him to take it, I was none the better for that, and was at last compelled to move out myself, and leave him in undisturbed possession. I assure you I did so very unwillingly, for I never had a more comfortable shell."

"It was too bad of him," said the Anemone ; "but I daresay he thought that, as you were the more active of the two, it would be easiest for you to move. I am afraid he would fare badly when left alone, after having had you to provide for him."

"I could not help that, though I was really sorry for him," said the Hermit. "But there is another kind of Anemone, which is still more exacting than that. Not content with living outside, it extends itself round the mouth of the shell as nearly inside as it can get, with its mouth just under the feet and claws of the Hermit, in order that it may secure

all the scraps that fall.* Now, that I never could endure : it would interfere rather too much with one's domestic comfort to have a Nereis inside one's shell, and an *Adamsia* outside close under one's claws. Besides, the *Adamsia* spreads itself out to such an extent that it makes itself meet round the mouth of the shell, so that any one might imagine it to be the rightful owner of it, and the Hermit only a lodger."

"Very unpleasant, indeed, to your feelings as a proprietor, I should imagine," said the Anemone, with all the sympathy possible to one of her calm disposition.

"You are right, and I never would submit to it," said the Hermit. "But my cousins do, and say they like it. They are most considerate to the *Adamsia*, and when they are going to move, always give it due notice, that it may be ready to move too."

"How does it manage to move?" asked the Anemone, with interest.

"The *Adamsia* loosens its hold from the shell, and then clings to the Hermit, who carries it carefully to the new shell ; and, when he is settled, helps it to fix itself comfortably, by supporting it with his claws and putting it in the right position."†

* The *Adamsia Palliata* which thus attaches itself to the shells occupied by the *Pagurus Prideauxi*. "Aquarium," page 134.

† "A Year by the Shore ;" *Good Words* for Sept. 1864.

“What charming creatures your cousins must be!” said the Anemone, forgetting, in her feeling for her relation, that this praise was rather a reproof to the Hermit, who had so carefully disowned any merit of the kind for himself.

“They show themselves to be amiable in taking so much trouble, but I suppose they find it pay in the end,” observed the Hermit, coolly. “And then as they live in the deeps, and never take long journeys, it is less inconvenient for them than it would be for us. But,” continued he, changing the subject, “since you do not travel in that way, may I, without being rude, inquire how you do it when you wish to move? I do not observe that you have any feet.”

“I do not consider that feet are at all necessary,” replied the Anemone; “at least, not feet like yours, which, indeed, seem to me to be too thin and slight to be very firm or steady. I have one large foot, the base by which I adhere to the rock, and that is a very substantial one. I can slide or glide along on this foot; or, sometimes, when I am very friendly with the Waves, I inflate myself with water, thus making myself into a ball, and then float along with them. This is very good fun, and is no trouble. Some Anemones walk on their hands, and I have heard of one who chose to walk first on his hands,

and then on his foot, turning over and over in what I should consider a very discomposing fashion ; but I think such a way of walking is not common. The *Anthea* generally walk on their hands, but their hands are thicker and stronger than ours, and, as the *Anthea* cannot draw their arms in and make themselves into balls as we do, walking in that way may be a change for them. I only know that *I* don't care about such a mode of progression. It is uncomfortable I think, not to say undignified."

"I perfectly agree with you," said the Hermit. "I never could have imagined such a thing to be possible. I know I should be sorry to try to walk on my claws. And your delicate hands were still more unsuitable for the purpose. I think it is a pity that you have not a shell over them as I have ; it is so much safer, as it keeps them from so many dangers. And then, although the *Oyster* does make light of it, it is a distinction to have a shell."

"Well, I don't think it would be convenient for me, especially on my tentacles," said the *Anemone*. "Indeed, I fancy a shell of any kind must be very much in the way. A thick skin answers the same purpose as far as I am concerned, and I consider that it looks better, besides lasting longer. I care more about comfort than about distinction."

"That is probably a matter of feeling or experi-

ence," said the Hermit. "I have tried the shell, but not the thick skin, so I judge only from my own side of the question; *my* skin, as I have mentioned before, is very thin, and I know from painful experience how little protection it would afford me, were I not defended by my natural and my borrowed shell."

"It is well to be content with one's own possessions," said the Anemone. "I always make the best of my circumstances, and in general have a very comfortable life. There are, of course, occasional little mischances, but I just endure them quietly, and they pass over. Sometimes I have holes made in my skin, but I soon mend them, and am none the worse."

"Your skin must be thick, indeed!" said the Hermit. "Now that I think of it, I remember having noticed that before. I once saw a brother of mine try to get an *Adamsia* off a shell of which he wished to take possession. He thought he could pick it off with his claws, but he found himself quite mistaken, for the more he picked the closer the *Adamsia* shrank together, and the harder the skin seemed to grow."

"What a cruel creature he must have been!" said the Anemone. "Did he succeed?"

"Not in the smallest degree: he might as well have tried to pick the shell itself to pieces. He was

in a great rage at having to leave the shell ; but I think he did get it after all, for the *Adamsia* could not live long in the empty shell. I don't know what had become of her friend, the tenant of it, that he had forsaken her."

"I suppose she could not take care of herself, after having been used to being provided for," said the *Anemone*. "But, in general, it is no easy matter to injure an *Anemone*. I have seen one quite cut in two, the whole of his tentacles being severed from the base."

"Of course that was an end of him!" said the Hermit.

"Nothing of the sort!" answered the *Anemone*. "He was a philosopher, and took the whole affair as coolly as possible. It was not long before he grew another set of tentacles as good as the first, or, indeed, better, so that, on the whole, it was rather an advantage than otherwise to him. The most curious part of it, however, was that the severed tentacles grew a new base.* We were very much puzzled to know which was our friend; whether we had *two* friends instead of one, or if the two were to be considered as one: but we concluded that the one with the first base was really

* Mr. Lewes' "Seaside Studies."

our friend, because the foot is the most important member of the body. It matters little if the tentacles or the skin are injured, but a serious injury to the foot itself is almost always fatal."

"I am truly surprised to hear such things," said the Hermit. "I never have considered feet of any consequence, for if I lose a few of mine they soon grow again; perhaps, however, as you have only one foot, that may make a difference in your case. But I most certainly could not bear to be cut in two; and I agree with you that so remarkable a change in your friend must have been very perplexing. The Terebella told me something similar about the Leaf-worm."

"Yes, I hear it is quite a common thing amongst some of the *Annelida*," said the Anemone. "That is one point of resemblance between them and us; not however, that I desire to claim relationship with them, though they say they are of much higher rank than we are. That may be true, but I think many of them are ugly and disagreeable, and I would much rather be an Anemone than a long, thin, sprawling Worm. I understand that those especially which live in the mud can grow almost any number of new heads and tails. Talking of *tails*, now what can be the good of tails? Do you know?"

“Certainly,” said the Hermit. “Amongst Crabs the tail is a mark of distinction. The Lobster, the head of the whole race, has a marked and beautiful tail; and those Crustaceans nearest in rank to him resemble him most nearly in this respect.”

“Indeed,” said the Anemone; “in that case there may be some use in having a tail. I never could see any before; though, as so many creatures have tails, I might have supposed it was for some end. I am quite obliged to you for pointing it out to me.”

“The obligation is all on my side, I am sure,” said the Hermit, with a grace that showed how much his social feelings had expanded even in so short an experience of society. “I feel deeply indebted to the Waves for introducing me into company so instructive and agreeable as I have found in the Basin. From old associations I have always had a friendly feeling for the Anemone family, but my conversation with you has given me a higher respect than I ever had before. I must confess that I have sometimes rather looked down on them as creatures who not only had not shells, but even had no desire to have them.”

“I hope that in time we may overcome that little prejudice of yours in favour of shells,” said the Anemone, pleasantly.

“If it is possible, I am sure you would be able to do it,” said the Hermit. “My opinion on that point is in some measure changed by things I have recently seen and heard; and though I am convinced that it is best to have a shell, I still can now believe that it is possible to exist very happily without one. For example, our friends the Waves have nothing of the kind, and they need nothing more than they have. Are they very intimate friends of yours?”

“Oh yes, they are great friends of ours!” said the Anemone. “They come very frequently to see us. I do not think we could do without them; and the Sunbeams, too, who are so bright and beautiful, and tell such lovely stories. I don’t know which I like best. I do love the Sunbeams, and wonder that so many of my relations care little or nothing for them. Very few Zoophytes like them at all.”

“Most Crustaceans have quite an aversion to the Sunbeams, and would do anything rather than go near them,” said the Hermit. “But others, again, like them very much, and could even live altogether with them. I have heard, but I scarcely know how to believe it, that creatures exist which dislike the Waves, and which can breathe without water. Some Crabs spend part of their time on

shore, and they hear strange stories of land and air animals."

"All quite true," interposed the Barnacle, who had been employing himself with fishing, but having caught as much as he wanted, was now waiting for another opportunity to talk. "Quite true; for I remember that once, a long way from here, we drifted on shore, and there met with a most delightful Crab, a wonderful traveller, who lived far inland, and only paid a visit once in a year to the sea to get a new shell, as there were none to be found inland.* Perhaps, too, he wanted a little sea-society for a change, after the land-society. Such stories as he told us of them! There are many who are related to us, for they are real *Articulata*. Some are like Crabs, with round, small bodies, and very long, thin limbs, sometimes covered with fine hair."

"Spider-crabs, I suppose, like those which live in the Oyster villages; useless things they are, for they can scarcely walk at all on such long, thin legs," said the Hermit.

"No, they are not Crabs at all," said the Barnacle, "and they sometimes live amongst the land-weeds,

* The Land-crabs of Jamaica, who live inland in immense numbers, pay a visit to the sea once a year only.

and sometimes burrow in the earth. They can spin, too, far better than the Mussels, and weave nets to catch their prey in."

"I never heard of a Crab that could spin," said the Hermit.

"There are others which have wings under their shells, pretty shining shells, and they can swim in the air with their wings, or walk with their feet on the ground. And others, bright coloured like the scallops, with beautiful eyes, but no shells, only wings instead; these, as the Crab asserted, were in their infancy hairy Worms, a fact very difficult to believe, if I could not so thoroughly trust the Crab. He said, too, that many real Crustaceans lived on shore, and one, either a Lobster or a Crab, climbed the great land-weeds, higher even than the largest *Laminaria*, and there lived upon something which he called fruit, growing on the land-weeds. I don't know what that can be, for nothing grows upon sea-weeds. There were also a great many other wonderful stories, more than I remember."

The auditors of the Barnacle looked as if they had already heard more than they could understand. They knew nothing about Spiders, Beetles, or Butterflies, and in England there are no Crabs so adventurous as the *Birgus*, noted for his partiality to the young fruit of the cocoa-nut tree; and

knowing nothing from their own experience, they were scarcely able to accept that of others, although they did not for a moment think of doubting the word of the Barnacle, for, as I observed before, in society under the Waves there is little known of such a thing as not speaking the truth, or even of that form of it which, in travellers, is sometimes above the Waves mildly called romancing.

“He told me, too, about some more Worms, which had great numbers of feet, and ran about, instead of crawling or swimming; what do you think of that?” said the Barnacle.

“I can’t believe it; none of the Worms have any feet. That is why they are the lowest class of *Articulata*,” said the Hermit, decidedly. In this he was both wrong and right. Centipedes certainly do exist, but they are not Worms, though they may resemble them in general appearance. They have true jointed limbs, which none of the *Annelida* possess.

“It was true, though,” answered the Barnacle. “The Crab was a most intelligent fellow, and could not be mistaken. I wish I could have gone with him to see the land.”

“Well,” said the Hermit, “I can’t understand how any Crab can choose to go and live on land. I once tried to walk on the beach, but I was very

glad to get back to the sea as fast as I could. I don't object to the Sunbeams, but I think air is so very unsatisfying."

"For my part," said the Anemone, "I think it is rather a nice change sometimes to be left high and dry with the Sunbeams. I often have been, and I quite enjoy it. I always draw in my arms for fear of accidents, and then I am all right. But still I quite agree with you, that for a permanent residence water is the only endurable thing. I never could live on land. I should soon starve without a good supply of water."

"I should like very much to know," said the Hermit, after a pause, in which he had been looking fixedly at the Anemone, moving his little foot-jaws very rapidly as is the habit of Crabs when in a quiet, contemplative mood, "I should like to know how you defend yourself when you are attacked. You have no shell, and you cannot run away from an enemy. It puzzles me to know what you do."

"My skin is sufficient to protect me in a general way," answered the ever-obliging Anemone. "When I draw myself together, there are few things can do me any harm. But many of my relations are well defended against their enemies. The Daisies, Parasites, and others, are supplied with an inexhaustible store of poisoned arrows, which they use either for

catching prey, or as a means of defence. These arrows are attached to very fine threads, and may be either quite thrown off, or remain connected with the Anemone.* In the latter case they are useful in drawing the prey to the tentacles. In the former, woe to the unfortunate in whose flesh they are thrown—if he is thin-skinned, he has small chance of escape.

The Hermit made a mental note that he would in future avoid changing his shell within shot of an Anemone, and instinctively he moved a little farther away from his fair companion, who, observing the movement, said,—

“ You need not be alarmed, I have no arrows ; and, if I had, should use them only against enemies, not friends. Besides, your shell would protect you.”

“ My never-to-be-too-highly-valued shell ! ” thought the Hermit, as he expressed his admiration of so complete a system of warfare as that presented by these poisoned arrows. He then wished to know if the Crimson Anemone never

* The existence of these poisoned arrows seems to be generally admitted, and Mr. Gosse speaks of it in all his accounts of the *Actinia*. Mr. G. H. Lewes, in “ Seaside Studies,” disputes the poison, though he acknowledges that the arrows are there.

felt the want of them, or was disposed to envy her more highly-favoured cousins.

“There is one enemy against whom my skin fails to protect me ; and I would willingly use the arrows in his case if I could get them. He is the special enemy of our race ; and is a frightfully ferocious monster, though, from his appearance, you would never suppose such a thing. Why, there he is actually coming this way ! You will excuse me if I retire as much as I can from observation till he has passed. I am obliged to be careful.”

As she said this, the Anemone drew herself up into a round, compact ball, as close to the rock as she could get, leaving the Hermit to encounter the new comer as he best might.

CHAPTER VI.

THE Hermit was naturally anxious to look at the "monster" who so alarmed his fair friend, and he turned with no slight curiosity to the approaching Eolis, whom he recognized as the identical Sea-slug, whose remark on his own arrival in the Basin had called down the rebuke of the Prawn.

Certainly, as far as appearances went, the Eolis was not in the least like a monster. In form and colour he resembled his relative, the white Garden-slug; but here the resemblance ceased, for the Eolis is beautiful in a degree to which the Common Slugs can make no approach. In length this particular Eolis measured about two and a-half inches, and he was remarkable for the beauty of his *papillæ*, little finger-like projections, generally supposed to act as his lungs. These were transparent, showing a centre core of rich crimson, and reflecting from their surface a brilliant flush of steel-blue; they

were tipped with opaque white, and were arranged in six rows of little clusters down the back of the Eolis. Waving his tentacles with much grace, this distinguished-looking personage glided with a dignified movement towards the Hermit, who, after his astonishment had subsided, indulged in the rather sententious, but very natural remark,—

“When I first began my travels, my earliest discovery was of the difficulty of judging from appearances, and assuredly no fact has been more confirmed than this. Who, for instance, could have suspected those pretty Anemones of having poisoned arrows, or could suppose this elegant creature to be a ‘ferocious monster?’”

As he thus moralized, the Hermit, partly out of mere curiosity, partly with the intention of testing the temper of the Eolis, gave him a gentle little tap with his claw. On this the offended Slug instantly stiffened his *papillæ* after the fashion of an irritated Porcupine, and marched indignantly off, exclaiming against the “impertinent familiarity of ill-bred strangers.”

“Not good-tempered, at any rate!” was the verdict of the Hermit, as he looked after the retreating Eolis.

“Is he gone?” inquired the Anemone, cautiously.

“Yes,” said the Hermit; “but here comes

another of the same family. Rather different, however, as he is much stouter, and has a smooth back, with a crown of feathers on it."

"That is a Doris, cousin to the Eolis, and much less active; I don't mind him so much," said the Anemone.

The Doris was larger than the Eolis, and much broader. From the great resemblance it bears in form and colour to the half of a cut lemon, the Doris is commonly called the Sea-lemon. Instead of *papillæ*, it has on its back a crown of feathery gills; and its tentacles, which are curiously sheathed, protrude through the mantle, which covers the head as well as the body. The Doris, as it walks, frequently raises the edge of the mantle, so as to display the brilliant scarlet foot, which is its chief attraction.

"I should have supposed from those feathers that the Doris was connected with the Cucumaria," said the Hermit.

"Not in the least!" said the Anemone. "The Sea-slugs are Molluscs of very high rank, and would quite look down on the Cucumaria."

"Do you wear those feathers for use, or for ornament?" asked the Hermit, as the Doris paused and deliberately surveyed him.

"For use, of course. These feathers are my

gills," said the Doris. "As my family, as well as that of the Eolis, and of our cousins the Tritonia—who are like me, but have *papillæ* on their sides—are distinguished for having our gills uncovered, we have them made to look pretty."

"Have you many relations, and do they all wear their gills as you do?" said the Hermit.

"We are *Gasteropoda*, so all the Univalves are our relations," said the Doris. "But they wear their gills in a great many different ways. Our nearest relatives, three families of Gasteropods who do not show their shells, wear their gills under their mantles, where they also have their shells. I don't in the least see why the *Bulladæ* should hide theirs, because they are pretty, white, and transparent, rather like half a Bivalve shell. Those made by *Pleurobranchus* and the *Aplysia* are not nearly so pretty, so one does not wonder that they prefer to cover them up."*

"Have you no shell?" inquired the Hermit. "I used to think that all the *Mollusca* made shells."

* Those of my readers who are not afraid of long words may be interested in knowing that the *shell-less* families of the *Gasteropoda* are divided into two Groups. I. *Nudibranchiata*, or naked-gilled, including the *Eolidæ*, *Doridæ*, and *Tritonidæ*; and II. *Tectibranchiata*, or covered-gilled, including the *Bulladæ*, *Aplysiadæ* and *Pleurobranchidæ*.

“Certainly not,” said the Doris; “most of the highest *Mollusca* have no visible shells: you are thinking of the Univalves and the Bivalves, who always have shells. Our family have none: some of us have them when we are very young, but when we grow older we throw them away. It is quite a matter of taste, and variety is agreeable.”

“Is that one of your family?” asked the Hermit, pointing to a Sea-hare who was browsing on some sea-weeds near.

“That is the *Aplysia*, our half-cousin,” said the Doris. “He wears his gills on his back under a shelly plate, which is all the shell he has: his mantle is outside of that again. Poor fellow! he has a very dingy mantle, never anything better than dull browns, nothing like ours in colour, and I am really often very sorry for him. But, of course, he can’t help it, and he makes up in size for what he wants in beauty. The Sea-hares are good, quiet creatures, very odd in many of their ways, but quite harmless. Just think, for instance, of their choosing to live on nothing but sea-weeds.”

“I thought that one seemed to like sea-weeds,” said the Hermit. “I never noticed any one eat them before, though I believe many creatures do so.”

“Yes, is it not queer?” said the Doris. “I

think it is very ridiculous for any one to live on seaweeds in a place stocked with animal food."

"Well, I don't know that it matters much if *he* likes to do it," said the Hermit. "As a question of personal taste *I* should not like it, but if he does, he has a perfect right to please himself. The Anemone says she likes to live on sea-water alone for weeks together: I don't object to her doing so if she chooses, though I should think it very poor fare."

The Sea-hare, a mild-looking animal, if an eccentric one, raised his head and nodded approvingly at the Hermit, remarking as he did so,—

"One can see that you are a traveller, and know something of the world. You have learned to tolerate differences of habits and tastes, and not to measure everybody by yourself. Nothing more clearly shows a large mind than that."

"Really a remarkably sensible animal, in spite of his peculiarities," said the Hermit, as the Sea-hare returned to his repast. The Hermit, you see, was no exception to the general rule that nothing so quickly opens our eyes to the virtues of others, as their appreciation and approval of ourselves.

Few Molluscs, wonderful as these are in their almost endless variety, are more curious than this Sea-hare. Its name comes from the aspect of a pair

of tentacles which stand erect, suggesting the ears of a hare, or even the horns of a cow, for it is sometimes called a Sea-cow. There are, indeed, two pairs of tentacles, but the second pair, being near the ground, are not so conspicuous. Another marked peculiarity is a hump on its back; but an amusing description is given by Mr. Lewes (*"Sea-side Studies"*) which will present a more vivid picture of the Sea-hare than one more accurate could do without being too long, and I therefore copy part of it.

Mr. Lewes says: "One would fancy them slugs which had been troubled with absurd caprices of metamorphosis, and having first thought of passing from the forms of slugs to that of hares, changed their weak minds, and resolved to be camels; but no sooner was the hump complete than they be-thought themselves that after all the highest thing in life was to be a slug, and so as slugs they finished their development. Not, however, without further caprices, since, instead of filling its mouth with teeth to grind its vegetable food, the Sea-hare transposes its teeth into its stomach, or rather into one of its stomachs, and not the one nearest the mouth, but the last of the series, as it passes into the intestines; so that after the food has undergone preparatory digestion it has to be further ground by these teeth."

The Hermit, whilst watching the proceedings of the Sea-hare, had gradually advanced along a ledge of rock till he was not far from the surface of the water, where his attention was suddenly attracted by a spluttering in the rock near him, followed by a sudden ejection of sand and water from a hole. This marked the residence of a Pholas, the maker of those pretty, white, pointed shells which are amongst the treasures of shell-collectors on English shores. The custom of the Pholas family is to burrow among rocks like rabbits in sand-hills, and this individual Pholas, having increased in bulk, was making his house larger, and putting the *débris* out of the mouth of the burrow, that he might not be incommoded by the dust.

A gaily-coloured Scallop, or Pecten, was clinging to the rock not far from the Hermit, looking, as she opened her valves as wide as possible to show her fringed mantle, like a bright butterfly resting after a flight; a resemblance heightened by the numerous eyes down the borders of the mantle glistening like sparkling jewels. Observing the Pholas, the Pecten exclaimed,—

“Did any one ever hear of such a fancy as this of yours? Just think if I had to bore my way through solid rock, instead of spending my time in dancing and flying! What ever should I do? You had

better come out of that hole and learn to fly ! That *is* fun, I can tell you !”

As she spoke the Pecten proceeded to give an illustration of the fun, and, forcing the water out from between the edges of her mantle, she took a flying leap to a neighbouring ledge of rock, and was back again before the Pholas had collected himself for his reply, which he gave in a peculiarly deliberate and decided manner.

“I am inclined to think,” said he, “that by such hasty and ill-considered movements a degree of instability of character is manifested. I prefer calmness and deliberation, and consider that patience and perseverance are the first of all virtues. It is by exercising them that I can bore into the hardest rock, and in so doing gain a satisfaction which you can neither know nor understand.”

“His powers of boring are not confined to hard rock,” observed the Pecten, flippantly, “and he might be content to admire his favourite virtue without obliging every one else to practice it whenever he speaks. For my part I don’t see the good of patience, and I am quite satisfied in being able to leap and fly.”

“It must, however, be very needful to the Pholas in his work,” said the Hermit. Then turning to the Pholas, he continued, “I cannot see how you

manage to pierce the hard rock. You must surely have some curious instrument in your shell with which you work."

"My shell itself is the only instrument I have," replied the Pholas. "There are sharp points at the front edge, which, as I turn from side to side, grind the rock to powder. I am also assisted by my foot. The powder is ejected from my burrow with my siphons."

"How is it," inquired the Hermit, "that your shell is not also worn away?"

"Because, for one thing, it is harder than the rock," replied the Pholas; "and for another, the shell is renewed, whilst the rock is not. In course of time, indeed, the points are worn down, but they last as long as there is any occasion for them."*

"What are the siphons of which you speak?" asked the Hermit.

"You know that all Molluscs have a mantle," returned the Pholas; "but I suppose you don't know that among burrowing Molluscs the edge of the mantle is in one place folded into a double tube, by

* The vexed question of the means by which the Pholas makes its excavations is argued at length by Mr. Gosse in "Good Words" for Feb. 1864, and also in "Glimpses of Ocean Life" (Chap. xv.), by Mr. Harper, who gives much information concerning this curious Mollusc.

which water is supplied to the gills, without coming into contact with the sand or mud through which it must pass in its way through the mouth of the burrow. My siphons, you see, are open to the water, but my gills are some distance down in the burrow; and, if a continual current was not kept up, I should not be able to breathe at all."

"Why is it a double tube?" said the Hermit.

"Because the fresh water runs down one tube, and back again out of the other, after I have breathed all the air out of it. It is necessary to have two distinct passages, or the fresh water would get mixed with the other," answered the Pholas.

"A very good arrangement indeed!" said the Hermit. "I wondered where the air came from, when creatures burrowed away from the water. I understand now."

Then, as he looked about him, his quick eye observed some little holes in the rock, in which were some moving red objects, so he said,—

"Have any of your family red tips to their siphons? Yours, I observe, are yellow."

"Those are Red-noses; or, to speak more respectfully, *Saxicavæ*; cousins of mine," responded the Pholas. "They are smaller than we are, and have rounder shells. They do not burrow so deep as we do."

“ I see a shell-tube, with a frill round it, coming out of one of the small holes ; is that another burrower ? ” asked the ever-observant Hermit.

“ No, that is the work of a *Clavigella*, one of the Bivalves with siphons. He is not one of those whom I particularly admire, as I think he shows a want of energy in being content to take up his abode in the deserted hole of a *Saxicava*. In his infancy he swam about free, but he finally made a settlement in an empty hole ; and as he did not intend to move again, he fastened one of his valves to the end of the hole, then he made a shelly-tube for his siphons, which was the end of his work for life, and now he never does anything. I don't object to him for living there, because I never could see the use of aimless wanderings, when one has a comfortable home of one's own ; but I do think it shows extreme indolence of disposition to take an old empty hole, instead of making a new one in an independent manner.”

“ Well, now, in my opinion, that is the only sensible part of his proceedings,” said the Hermit. “ What would be the use of taking the needless trouble of making a hole when he could get one ready made ? I should object to his settling down for life in one spot.”

“ Now, I think the *Gastrochenidæ*, who are cousins

of the *Clavigella*, are most to be admired," said the *Pholas*. "They make their own burrows, and in addition to that always make shell-tubes too, so they are much more skilful than the *Clavigella*. Sometimes, when a *Gastrochena* cannot find any solid rock, he makes a tube out of bits of stone and shell, which he cements together lining it with beautiful smooth pearl, and lives contentedly in that."

"That must be your cousin, who is putting his nose out of that hole," said the Hermit.

"No, he is not a very near relation of ours, though he is one of our class, the *Conchifera*, but he has no siphon as we have," said the *Pholas*. "He is a *Lithodomus*, cousin to the Mussels—not a true borer, like our family. Some of the *Mytilidæ*, or Mussel family, seeing how comfortable we are in our snug holes, try to imitate us, but, as they are not provided with siphons, they could not live in deep burrows, even if they were clever enough to make them."

"How does the *Lithodomus* do?" said the Hermit.

"At first he is only fixed to the rock with the cords which he spins; but, growing more strongly attached to the situation, he resolved to settle for life, and gradually succeeded in making a hole. Since then he has given up his spinning, and does

nothing but eat and sleep. The *Modiola*, another cousin of his, who spins very well, does not attempt to burrow, but makes a nest of little stones, woven together with thread. It is, of course, all imitation of our doings, but, for that kind of thing, it is really very successful. I hear that the *Lima*, cousin to the *Oyster* and *Pecten*, also makes a nest; but as he can neither burrow nor spin, I don't know how he does it."

"How is it that you learn so much when you never go out?" asked the *Hermit*.

"Oh, I have visitors at home," said the *Pholas*. "The Waves are constantly passing the door of my house, which is where I generally receive company, not having room to ask them inside. Of course, I make special inquiries about all the creatures who live in houses of their own making: the Waves can tell me everything."

"It is not necessary to know how to burrow or spin before you can make a nest," said the *Pecten*. "The *Blenny*, who, being a Fish, cannot burrow, always makes a nest for her little ones to live in."

"And the Birds and air creatures make nests up among the great land weeds, as I heard from my friend the *Land-crab*," said the *Barnacle*. "They don't know how to spin, though some few can burrow a little; but they make nests beautifully. But

I am inclined to think that the cleverest among them all is our thin, long-legged relative, who can burrow, and spin, and make a nest too. It is a round hole in the earth, lined with the soft silk that he spins, and it has the neatest of round doors, also lined, and closing so tightly that nothing could open it on the outside.*

“By the way,” continued the Barnacle, addressing the Pholas, “I think it is to some relatives of yours that we are indebted for the pleasure of our visit to the Basin.”

“I thought that the Waves brought you here,” said the Hermit.

“So they did,” returned the Barnacle; “but we have not always gone about with the Waves as we do now. At first, as I told you, we settled down on a Ship, which is a great thing swimming quickly through the water wherever it chooses, and not going where the Waves wish it to go, though I have heard it does sometimes let the Winds take it their way. Very often it chose to stay for long periods in one place, generally some dark, narrow

* Our friend the Barnacle, in his ignorance of shore names, has not given a very clear idea that it was a Spider of whom he spoke; but he is perfectly correct in his description of the nests constructed by some species of these skilful little weavers.

corner, where nothing amusing was going on, and then we used to get dreadfully tired of it. So we were really very glad when the Waves at last, after vainly trying to make the Ship go with them, when it would persist in going its own way and not theirs, grew very angry—we never knew them so violent—and had a great battle with it, in which they conquered, and broke it all to pieces, setting our log free. Then the Waves took us about all over the sea, and when we said how much we liked the change, they told us that they would not have been able to set us at liberty so easily if it had not been for the help of a company of boring Molluscs, who made holes all through the Ship, and thus made easy work for the Waves after they had once found their way in.”

The Pholas listened with his usual gravity to this long story, and evidently considered the conclusion a family feat of which he had good reason to feel proud, for he replied, in a tone of calm satisfaction,—

“I can easily believe all you say. The Molluscs mentioned by the Waves are relatives of ours, the Teredos; they are, indeed, my nearest relations, though they have been claimed by the *Annelida*, because they are rather like them in appearance. That, however, is quite absurd, for the Teredos are

true Molluscs. They always choose wood to bore in as we choose rock, and they make remarkably neat burrows lined with shining cement. Your story clearly confirms my opinion of the value of patience, since it is by that alone that the small *Teredo* is in the end able to destroy the large Ship."

A large spinous Cockle, who had been listening rather impatiently, now said, sharply,—

"It may be all very well for you to take time with your work, but such tedious ways don't suit everybody. They would not do for *me*, I know. Just suppose that if when an enemy was after me I was obliged to spend days in boring! Much good it would do me! But as it is I can be out of sight in a moment."

This second exhibition of levity was more than the Pholas could endure, though he had borne quietly enough with the Pecten; so, without deigning to give any answer, he retired out again into his burrow, and resumed his work.

The Hermit, with a glance of admiration at the bright polished shell of the Cockle, said to him, —

"Do you also burrow in rocks?"

"No; I burrow in the sand," said the Cockle.

"Would you like to see how I do it?"

The Hermit expressed his great desire to witness

the performance, and advanced to a ledge overlooking the sandy floor, whence he had a good prospect.

The Cockle, opening his valves, put out his foot, which he inserted into the sand. It was a foot of which the Cockle might well be proud: it was very smooth and round and of a lovely red colour, like polished coral or cornelian, and when fully extended was some inches in length. It narrowed towards the point where it was bent into a sort of hook, which, grasping the sand, gave the Cockle a firm hold. After the foot was put as far down in the sand as possible, it suddenly contracted and thus drew the whole body of the animal down into the yielding material. After a few repetitions of the process the Cockle was out of sight. When he came up again, which he did as quickly as he went down, the Hermit was loud in expressions of admiration.

“Can you do that?” he said to the Pecten.

“No,” said the Pecten, “I am content with flying.”

“I can fly too,” said the Cockle, and, glad of the opportunity of showing off, he leaped half the length of the Basin and back without being in the least fatigued.

“What an uncommonly lively creature!” said the Hermit. “Are there many other Molluscs who burrow?”

“There are the Gapers, or *Myacidæ*,” said the Cockle. “They burrow in mud or sand. I don’t care much for them. They are very rough outside and are untidy-looking, for they never can quite close their valves, on account of a great ugly, wrinkled siphon, on which, however, they pride themselves very much; saying, forsooth, that they must have their water filtered when they are below the sand! I also go below the surface, and don’t need a siphon, so I think that is nonsense. It is not necessary for me to have so much water, so they might do without if they chose. I have only to keep my valves closed tight, and I can do an immense time without water.”

“It is very much dependent on habit, no doubt,” said the Hermit. “If you had been used to a siphon I daresay you would like it.”

“Then there are the Razor-shells, or *Solenidæ*, who have also long siphons,” continued the Cockle. “But there is more use for it in their case, for they make very deep burrows and stay most of their time in them. They live in those long, narrow, sharp shells, and their siphons are long too, so that there really seems to be no end of them. I like round compact bodies, neatly finished off and closely shutting. But it is not of great consequence how the Solen looks, as he lives so much under the sand.

He is rather a stupid, on the whole. What is the good of staying all one's life in a narrow burrow, bolt upright, and never doing or seeing anything?"

"Not much good, indeed!" agreed the Hermit.

"Well, good-bye, I'm going now, as I have been still long enough. I hope you will enjoy your travels!" said the Cockle, putting out his foot, and leaping away with a celerity that made the Hermit's eyes almost start out of their sockets with surprise. He soon recovered himself, however, and marched down from the ledge to the sand below, where he was proceeding to take a walk in search of other society, when he suddenly stumbled against a sharp something which protruded above the sand. "Ah, I suppose it is another of these burrowers!" he said, quietly, stopping to look at the obstacle, which rapidly became more visible, when, startled out of all propriety, he exclaimed, "Why, bless me! it is—no, it can't be—the feelers of a Crab!" as a pair of strong, thick *antennæ* made their way up, followed by a pair of long arms, and a small head with two great eyes, and finally the entire body of a comical-looking Crab, who, seating himself in an upright position, remarked in rather an injured tone, as he wiped the sand out of his eyes with his active little *palpi*,—

"You ought to mind where you are going. You

have disturbed me in a comfortable nap, and, besides, you might have broken my feelers off with that clumsy shell of yours ; and what should I have done then ?”

“ I am excessively sorry,” said the Hermit ; “ but who in the world would expect to find a Crab in that position ?”

“ Why not ?” said the Crab—*Corystes* by name. “ It is my usual position. I like the feeling of the cool, soft sand. It is delightful, I assure you.”

“ Indeed !” said the Hermit, doubtfully. “ But how do you manage about fresh water ? You cannot do without it as the Cockle can.”

My readers will understand that water to sea-creatures takes the place of our atmosphere to us ; only, instead of going *into* the lungs, as the air does with us, it passes *over* them, the oxygen being abstracted in the passage. As water is as hurtful to them as the air to us when the oxygen is gone from it, a constant supply is necessary, and you must remember this when you keep the poor animals in your Aquarium. If you do not keep up the supply of oxygen, you make them suffer as much as you would do if shut up in a small box. In all creatures which burrow some provision is made to meet this want, and few things are more interesting than the study of all the wonderful contrivances by which it is done. You cannot look at the least of these

insignificant creatures without new admiration for the wisdom which created and ever cares for them all.

The Corystes immediately saw the importance of the Hermit's question, but he answered, cheerily, —

“ Oh, that is all right! the sand allows the passage of the water, which I draw in with the movement of my feet-jaws, and after it has passed over my gills it is ejected through my *antennæ*, which, as you may see, are hollowed out and edged with bristles, so that when they are placed close together they form a tight tube for the passage of the water. I don't go any deeper into the sand than the length of my feelers, so I am quite comfortable.”

“ Well, I never heard before of burrowing Crabs, though it seems to me that all kinds of animals burrow!” said the Hermit.

“ Oh, haven't you?” said the Corystes. “ There is another Crab who burrows, the *Ebalia*, a funny little fellow who lives among gravel. Such a slow-coach as he is altogether!”

“ How does he get through gravel? I should think that would be worse than sand,” said the Hermit.

“ Of course he always descends backwards,” said the Corystes. “ He separates the little stones with his hind feet, and gradually makes a way for his body. He takes plenty of time about it.”

“Do you often come out of the sand?” inquired the Hermit.

“Not more than I can help,” said the Corystes. “I don’t like walking. It is inconvenient for me because of the great length of my arms, which are in the way on the sand, though they are of great use when I am in my burrow. With them I can reach anything near me without troubling to come out for it.”

The Hermit, on looking more particularly at the Corystes, was struck with his fierce and war-like appearance, and said,—

“Well, you look rather alarming, so it is perhaps better that you keep yourself hidden, for if you did not do so, nothing would ever come near enough for you to catch it, even with your long arms.”

“Quite a mistake, I assure you. I am the most peaceable of Crabs,” said the Corystes; “give me only my dinner every day, and I should never care to stir out of my burrow. Wont you come down with me, and try how you like it? You had better do so.”

“No, thank you,” said the Hermit. “I can’t do that, but I am delighted to have made your acquaintance.”*

* Those who desire to improve this acquaintance may do so with Mr. Gosse’s help in “Good Words,” for May, 1864.

“Truly, there are queer things in the world,” he soliloquized, as he watched the gradual disappearance of the *Corystes*, till nothing was left but the tips of the feelers, from which a constant little stream of water flowed out. “To think of the number of new things I have learnt! Why, even the number of my own relations is surprising in itself, and then their variety! To say nothing of Barnacles, and Prawns, and Shrimps, and Lobsters, there are all the Crabs—Crabs which live on land, and in the sea; Crabs which swim, and Crabs which creep; Crabs which burrow, and Crabs which climb; Crabs which live in dead Molluscs’ shells, and Crabs which live with living Molluscs. It is all very curious! What will come next, I wonder!”

That which came next was more than the Hermit either desired or understood. A great commotion in the water was the first sign of disturbance, and then ensued a scene which was incomprehensible to any of the animals who, frightened half out of their senses, fled in all directions. The Anemones shut themselves up; the burrowers all shrunk into their holes, or disappeared below the sand; the

Throughout the “*Year by the Shore*” there are many notices of the creatures introduced in this Chapter. For the fullest accounts of the Molluscs, the reader may consult Messrs. Forbes and Hanley’s “*History of the Mollusca*.”

Fishes sought the darkest recesses of the deepest fissures, and in an incredibly short time the Basin looked half deserted. Our poor friend, the Hermit, instantly scuttled into a dark corner, and went into his shell, covering the opening with his larger claw, and then turning the shell over, so that even that was concealed. Thus defended, he lay quiet, in fearful anticipation of whatever might “come next.”

CHAPTER VII.

HIS disturbance was caused by a party of young Naturalists on an exploring tour, who, with great glee at finding so much treasure, plunged their arms into the Basin, and began baling the water out of it to render their schemes of spoliation more practicable. They gave small thought to the consternation caused to its unfortunate inmates, and yet they were not at all remarkable for cruelty of nature—being, indeed, remarkable among their friends for the exact opposite of that. But they had just fitted up a fine new Aquarium, in which they had made arrangements for the perfect happiness of a limited number of guests, and they were now in search of these same guests, though not particular about the strict formality of their invitations; which, however, under any conditions, would probably have been declined with thanks, if the guests had been allowed free choice.

Philip, George, and Nelly Gordon had long been ardent students of Marine Zoology, even under the disadvantages of town-life and rare visits to the sea-side, and now they were all quite wild about it, having taken up their residence at the pretty village of Ravensholme, on the Devon coast. They had become experienced adepts in the mysteries of trawling, dredging, &c. and had gained no inconsiderable insight into the manners and customs of the natives of the sea-shore, whose privacy they so ruthlessly invaded. Philip, the eldest, about seventeen years old, was a fine-looking, intelligent youth, very studious and retiring in his habits, but still with a good deal of quiet fun lurking in the depths of his thoughtful dark eyes. Very unlike him in most respects was his brother George, a year or so younger than he. Philip was tall and slight, with dark wavy hair, and dark eyes ; George was middle-sized, and rather thick-set, with short, straight, brown hair, and his eyes were grey, and deeply set in his head. Philip was noted for his enthusiasm, and quick poetic fancy. George was a model of calm "common-sense," and patient, persevering industry. But, in spite of all these differences, the two brothers were perfectly united in their pursuits and tastes ; indeed, it might be that the very differences united them the more closely, for one gained

from the other the benefit of qualities wanting in himself.

Nelly, their only sister, a sunny-hearted girl of thirteen, with merry brown eyes, and long, curling hair, was devoted heart and soul to her brothers, especially perhaps to Philip, and entered as fully as she could into all their pursuits and studies. It was her great delight to join them in their excursions, when she submitted cheerfully to wear her oldest and least becoming attire, and was even utterly regardless of the effect produced by her appearance on their visitor, Edward Forrest, as she came downstairs fully equipped for the beach. She bore with perfect composure the look of amazement with which his eyes, accustomed to the refinements of city costume, turned on her. To be sure, she knew it was much more pretended than real, for Edward never let an opportunity of teasing pretty Nelly pass unimproved, and she had more than a suspicion that she would have a speedy chance of revenge.

Edward was Philip's friend, and had come from town to spend his summer holidays with the Gordons. He entered with great eagerness into all their interests and occupations, and at once announced his intention of "becoming a distinguished Naturalist," as he "never aimed at anything lower

than the highest possible mark"—so he said, at least.

Certainly as to externals the party could not be considered either graceful or prepossessing, their costume being arranged entirely with reference to the difficulties and destructiveness of wet rocks, slippery sea-weed, and salt water. They were all, in addition to this, provided with baskets, bottles, and pans, for the safe transport of their expected prey, as well as with sticks, hammers, and chisels, with which to dislodge and break up the rocks and stones amongst which such prey most loves to congregate.

But a merrier party could not be. Every little mishap, particularly those befalling the inexperienced Edward, of course by far the most numerous, was a source of lively remark and joyous merriment. To Edward it was "glorious fun." His laughter-loving nature, faithfully indicated by his roguish blue eyes, and the bright curls clustering all over his head, found full scope in the freedom of country life, and took ample compensation for town restraints in all kinds of wild pranks and extravagancies.

It was he who first saw the Basin, and great was his exultation at the discovery of such rich booty. Sinking down on the rock almost breathless after a hard climb, he exclaimed, as he looked through the clear water at the treasures before him,—

“Now this is what I call sensible! I am prepared to go in to any extent for Zoology made easy in this style.”

“You are certainly in luck, Ned,” responded Philip, gazing delightedly at the endless beauty of form and colour before him. “I never saw a Basin so rich in specimens before: we usually have to content ourselves with a few at a time.”

“After Herculean labours with a crowbar amongst wet rocks, as I know to my cost!” added Edward.

“You’ll soon get used to all that,” said George, calmly.

“Oh, of course! and no doubt the exercise is highly beneficial to one’s health,” said Edward. “But I make a point of taking all my good things in strict moderation, and I am not sure that slipping down among slimy sea-weed, and cutting one’s hands to pieces with sharp rocks in getting up again, can be considered as coming under that head. To say nothing of the damage to one’s clothes!” he added, giving an eloquent glance over his shoulder at his coat, which showed unmistakeable signs of the disaster to which he referred.

“In my opinion that forms only an agreeable and amusing variety in an excursion,” remarked Philip, philosophically.

“A fine sentiment to come from one’s bosom

friend!" exclaimed Edward, "but perfectly in keeping with the heartless way in which you all stood and laughed, instead of helping me up. However, I forgive you. Oh, there's a fine Star-fish! I know what that is, even if I can't always recognize a beautiful flower in what seems to me a lump of sandy jelly. Let me catch him!"

"We shall find it easier if we get some of the water out," said George, suiting the action to the word, and thus creating the alarm which we have endeavoured to describe as prevailing in the Basin.

When the water was low enough to satisfy the spoilers, and it had been allowed to settle again, Edward could not imagine what had become of the animals over which he had rejoiced, and he expressed his dismay loudly.

"Where's my Star-fish?" said he. "Oh, here he is!—now I'll insinuate this can so gently under him that he will never know anything about it."

The Brittle-star had not been able to escape, as could many of the more nimble creatures around him, and Edward proceeded to carry his plan into execution; but, happening to touch one of the rays, he was amazed to see it drop off, one after another sharing the same fate till only the central disk remained, which he picked up with the rueful ejaculation, "What a sell!"

“Just what I expected,” said Philip, by way of consolation. “You must be artful indeed to get round an *Ophiocoma*! They are the Spartans or Indians of the lower world, and, when they have any voice in the matter, always prefer death to captivity.”

“There’s the advantage of learning!” said Edward. “Now *I* never should have expected a case of suicide under that provocation. Who could imagine that a single touch would drive his sensitive mind to distraction, and his more sensitive body to destruction in that startling way?”

“I wish we had brought a bottle of fresh water with us, and then we might have got some entire specimens, dead if not living,” said George. “Fresh water is instant poison to many sea-creatures.”

“What uncommonly simple tastes you have, George, to content yourself with sea-weeds!” said Edward, after a pause. “I don’t see that you have gathered anything else to-day.”

“I have gathered only one piece of sea-weed to-day,” said George.

“Why, you have a can full of them!” exclaimed Edward.

“Quite a mistake, my dear fellow!” returned George. “These are not plants, but animals; *Zoophytes* by name. I will show you, by-and-bye, that

at each of these points there is a little animal, at least as pretty as any of these Anemones."

"Since George got his new microscope, he never looks at anything visible to ordinary mortals," observed Philip.

"With such a world opened to one, it is excusable to neglect for a time, at least, the old one," said George. "You have some pleasures to come, I can tell you!"

Turning over a stone Edward surprised the Velvet-crab, whom he at once seized with no very gentle hand.

"Oh, Edward, take care, you'll hurt the poor thing!" said Nelly, in a pleading tone.

"Don't excite yourself, Nelly dear, it's quite the other way, I assure you," said Edward, coolly, as he extricated his finger from the claw of the Crab, who had not submitted to be captured without a struggle. "'The poor thing' is by no means ignorant of the noble art of self-defence."

"Mind you don't let him go!" said Philip.

"Then I shall *not* have to mind being pinched, though I daresay one may get used to that too, as 'an agreeable variety.' But though I have not yet attained your appreciation of 'the amusing,' Phil, I will try to emulate your devotion to science, and will therefore sacrifice myself to this 'specimen,'"

said Edward, spreading a handkerchief on the rock with the intention of securing his victim therein, as it was too active to be trusted in any of the cans.

“Can you describe the characteristics of that Crab?” said Philip. “He is worth remembering.”

“I am not likely to forget him for some time!” said Edward, holding up his injured finger; then, cautiously examining his prize, he added: “Let me see! In *particular*, I observe a neat brown velvet coat, glossy black edges to the shell, and very decided claws, bent to an angle that vividly recalls my first lesson on the violin; and, in *general*, I may add a marked unamiability of disposition.”

“Correct,” said Philip. “If you will endeavour to subdue a tendency to flippancy, which I regret to notice in you, I have no doubt that your powers of observation will prove valuable. You have noticed the points which gain for that Crab its common name of Velvet-fiddler. His scientific name is *Portunus Puber*, and he is the British representative of the Swimming-crabs. He does not equal his tropical relatives in his natatory feats, but still he is very much in advance of all common Crabs, which do not swim at all.”

An exclamation from George made them look at the water again, and they were surprised to see a

bright stream of colour spreading through part of the Basin.

“What’s the matter?” asked Edward.

“I have excited the indignation of this Sea-hare, and that is his way of expressing it, that is all,” replied George. “The *Aplysia*, or Sea-hares, are supplied, like the Cuttle-fishes, with the power of exuding a coloured liquid as a means of concealment when attacked. They hope to make their escape under the cloud which is thus raised. In the Cuttle-fish the liquid is black or brown, and is the sepia used by painters; in the *Aplysia* it is crimson or purple, and is not of any use, except as a pretty experiment in showing the effects of light in developing and changing its tints when used as a dye for cloth.”

“It is not of real use as a dye?” said Nelly.

“No, for it soon fades, although at first the colour is very fine. The poor Sea-hare has been dreadfully slandered in many ages, and has been regarded as an object of dread, on account of a variety of evil propensities falsely attributed to it. Mr. Gosse says that he has never seen any sign of these, though he considers it probable that there is some foundation for some of the stories. In addition to the purple fluid, the *Aplysia* secretes a milky liquor, of unpleasant odour, which is said to cause

pain to the hand or any other part of the flesh which it may happen to touch, besides bringing the hair off any such part." *

"You had better be careful how you touch him then," said Nelly.

"He is safe now in the bottle, and must endure it as well as he can," said George.

There was less talking as the work of devastation proceeded, for the tide was approaching the Basin, and our young friends were wishful to carry off as much as they could, and by working hard succeeded in filling all their cans and bottles with struggling captives before they took their way homeward with loud triumph.

In course of time, after a temporary residence in pans, basins, and small tubs, the captives were transferred to their home in the Aquarium, where they settled down after their various ways, soon forgetting, for the most part, that they were no longer free. The Anemones, whose tastes for sunshine or shade were duly consulted, soon made themselves perfectly at home. Our friend the Crimson Anemone was at first charmed to see so

* "A Year by the Shore," *Good Words* for June 1864.

much of the Sunbeams, but in time even she felt disposed to change her former opinion of them, and to regret the absence of the Waves, whom, since she had lost them, she thought she really preferred to the Sunbeams. They were always so fresh and cool, and were never unpleasantly intrusive, as it must be confessed the Sunbeams were at times. Yes, certainly, although not sentimentally inclined, the Anemone did at times think longingly of the delightful Basin, where so many happy days were spent! Still she never gave way to discontent, but, as was her wont, made the best of her circumstances: her one deep regret being that the Eolis had not been left behind in the Basin, for he still kept up his old habits, and lost no opportunity of annoying her.

The Doris and the Sea-mouse were affected in much the same way by the change, which was, as little as possible, for they were both of very quiet temperament, and were valued for their beauty, and not for their activity. The Sea-hare could never quite forgive his captors, and spurted out his purple dye on the very smallest excuse. But one could scarcely wonder at this, for the supply of fresh vegetables was extremely limited, and poor fare does not tend to improve the temper.

The Pholas, who had been dug out of the rock,

did not reconcile himself to his change of abode, and could not be induced to attempt burrowing in the stones of the Aquarium, evidently perceiving that there was no sufficient end to be gained by it. He lay languid and listless, drawing water into his siphons, and then ejecting it again in an aimless way, till George, wanting a subject for dissection, seized on him as the least likely to be missed.

The Mussel instantly set to work to spin herself a new set of threads, and was only disturbed when, for the sake of experiment, her threads were broken, and she was obliged to begin again. The Pecten and Cockle kept the Aquarium amused by their liveliness, though they murmured a good deal at the limited space allowed them. The Cockles, especially, often sighed for the depths of soft sand in which they formerly sported so gaily. The Oyster gave small sign of his feelings, and kept himself to himself in the closest manner, until at last, in spite of his reserve, a patient Star-fish succeeded in seizing an opportunity of entrance into his house, and taking practical revenge for the snubbing administered to the *Radiata* by the conceited Oyster.

There was no want of Star-fishes in the Aquarium, for specimens of all kinds were there. These, vying with the Anemones in brilliancy of colour,

made themselves objects of greater interest in consequence of the activity with which they roved about the rocks and up the glass sides. The Sea-urchin was never without admirers, and never again troubled himself with his inferiority to the *Mollusca*.

The active little *Terebella* had contrived to escape out of his back-door when his tube was descried and carried off as a curiosity. Indeed, most of the burrowers were safe. But the *Serpulæ* were seized and borne away in triumph; and, with the exception of a few which did not survive the removal, were soon to be seen waving their fans as merrily as ever. The Barnacles had been overlooked, for Edward, considering their log to be in the way, had thrown it out of the Basin into deep water, where it floated away, and the Barnacles had a new experience added to their already extended list, to relate to the new friends they might make in their travels. Some of the *Balani* were taken, and often called upon to display their fishing for the entertainment of the visitors to the Aquarium, which, as soon as they recovered from their first shyness, they were always ready to do.

The Velvet-crab gave Edward great trouble in his transport, for he was nearly wild with fear and rage: great bullies, as has often been observed, being

generally great cowards. But when he found no harm came to him he grew more composed, and speedily forgot his terror in the delight he felt, when, on emerging from under the stone where he had hidden himself on being put into the Aquarium, he beheld stalking majestically along, with his plates of mail gleaming blue in the sunlight, a large Lobster. The Crab immediately paid court to him, claiming relationship, and expressing his deep admiration. But, as the Lobster was a refined and discriminating animal, he soon saw the real qualities of the Crab, and declined to respond to his advances, treating him with marked neglect.

This was a source of great rejoicing to the Prawn, who was pleased to see the Crab "paid off" in his own coin," as she expressed it confidentially to the Broad-claw, when she related the circumstances, in a morning call which she paid him in his seclusion.

The Broad-claw, on the instant of his entrance into the Aquarium, had made his way straight to the flattest stone there was to be found, and had there ensconced himself, absolutely refusing to move out. He at once rejected the invitation of the Prawn to go to see the Lobster, declaring that he was determined not to stir till he was forced to do so; for, what with the exposure he had endured, and the violent separation from his family, he felt

himself even less able than before to meet strangers. If Crabs were much troubled with "nerves," as I believe they are not in any special degree, he would certainly have declared that his nervous system had received an incurable shock. His appetite, however, continued good, and he allowed himself to be soothed by occasional visits from the Prawn, their sympathy on the subject of "brushing" being a source of great comfort to both of them.

The Prawn never troubled herself that the Lobster did not notice her, and she was content to admire him from a distance. Not so the Crab, who could not forget the blow to his vanity. He moped and sulked in the darkest recess of the Aquarium, till he was looked upon as a very Ogre by all the small creatures there, who never dared to come within his range. His only excitement, from which he perhaps derived a gloomy satisfaction, was his standing warfare with his old enemy the Pogge, who occupied the same division as he did.

On the Pogge captivity had a most injurious effect: at no time of an amiable character, he was now vicious beyond description. Out of pure opposition he fixed his choice of a residence in the same dark corner which the Crab had selected, with no other result than the gain of an additional grievance; for the Crab, having possession first, took

good care to keep it. The only solace in the life of the Pogge was his remembrance of the conversation respecting the shell of the Crab, and he watched unrelentingly for his chance of vengeance when the Crab should again be defenceless. I am inclined to think that he waited in vain, however, for, as the Crab had reached his full growth, he did not think it necessary to have any more new shells.

But what of our friend the Hermit? is a question which I hope some of my readers are asking. I have anticipated events a good deal to tell you of the fate of our other characters, and now willingly return to the dismantled Basin, and the few terror-stricken survivors of its happy society. You will feel pleased, I hope, to know that the Hermit was safe, having been protected by his despised covering, which had been remarked by Edward as "only an old whelk shell," not worth his attention, engrossed as he was with the Velvet-crab. It afterwards occurred to him that it might have contained a Hermit, and he was sorry he had not looked. But the Hermit was then safe enough out of his reach.

Unconscious of his narrow escape, but yet quite enough alarmed by the danger he was in, the Hermit lay still long after all was quiet, and did not venture to look around him till he heard the

Waves begin to arrive with the rising of the tide. Great was his dismay and grief at the changed look of the Basin, and at the disappearance of so many of his new friends.

The Terebella was the first of the few survivors whom he met, and he, assured that the destruction was not the work of the Hermit as he was at first inclined to suspect, entered once more into conversation.

“Here is a fine state of things,” said he, “just as I had finished a beautiful new tube, to have it torn away from me, and to find myself obliged to set to work to make another!”

The Hermit agreed that it was indeed a hard case, and advised the Terebella to accompany him back to the deeps, for there he had never heard of such disturbances, except, indeed, sometimes when a dredge came down and caused all sorts of confusion, but this might easily be avoided by living in a valley into which the dredge could not penetrate.

But the Terebella thought the journey was too long for him to undertake, especially without any covering. He must first, he said, make a new tube, and then he might possibly give it his consideration. After which he disappeared, that he might lose no time in commencing his work.

The Corystes popped his head up to recommend

the Hermit to think seriously of the advantages of burrowing as a mean of safety. He had enjoyed a comfortable repose during the whole confusion, and had only accidentally discovered that anything was wrong.

The Hermit thanked him for his advice, but was afraid he was rather too old to think of making so decided a change in his habits as the one proposed. He concluded that it would be as well for him to return with what speed he might to his native valley, where, for the present at least, he thought he should enjoy a quiet rest after so much excitement. He accordingly mounted to the edge of the Basin, where, whilst he was waiting for a friendly Wave to see him, he heard the particulars of the catastrophe from an observant Red-nose, who had been able to keep a sharp look out all the time.

From this he was at no loss to connect the disaster with that race of evil beings, who, as it seemed to him, were the cause of all the serious ills of life. It was a great drawback to the pleasures of travelling, to come so frequently into contact with these troublesome Men.

As he thus mused he was perceived by his friends the Waves, who carried him, in the same way as he had come, back to the place from which he had started, where they bade him farewell with many

expressions of regret that his pleasures should have had so abrupt and painful an ending.

Arriving with no further adventures in his native valley, the Hermit soon paid his promised visit to his old friend, who listened to his account of his journey with a triumph which she did not try to conceal, expressing itself in such remarks as "just what I expected!" "I knew exactly how it would be;" "I told you so;" and things of a like consoling nature, ending at last with the hope that he would *now* be content to stay at home, and be at last convinced of the foolishness of his love of travelling.

The Hermit, though he listened patiently enough to her remarks, could not at all agree with her conclusion, and said that he had no intention of giving up the pleasures of travelling. Some disagreeables might always be expected, and no one with any spirit at all would ever be dismayed by these. The thing that struck him the most in his recent experience was its decided proof of the advantages of his shell, which had been the means of protecting him from many dangers, and which he now appreciated more than ever.

The Hermitess was astonished at a view so unlike her own—and certainly it does show the advantage of a calm, fearless spirit, to be thus able, out of the worst ills, to draw only a lesson of encouragement

and hope,—but, as the Hermit said that he did not desire to travel again for some little time, she did not make any further remarks. He soon gave her a decided cause for rejoicing when he took her advice by marrying her granddaughter, and settling down quietly for a time.

But as family cares do not burden Crabs, he was frequently able to make pleasant and instructive excursions, and to pay frequent visits to his friends the Waves. If he had any other dangerous adventures, he was fortunate enough to escape without injury, for it is certain that he lived to a great age, and died at last one of the most respected and respectable inhabitants of the valley.

CHAPTER VIII.

WHAT think you, dear readers, of this glimpse of “Life under the Waves?” Is there not enough in it to fill a summer’s day with wonder? And yet it is only the very tiniest peep into the marvels of the world of waters, taking in no more than some of the most evident of them, and never even approaching the depths. To go there we should especially need the aid of the microscope, a power that can give us more revelations, and can work more transformations than any fabled enchanter’s wand of old. Would you like for a moment to test this magical power? We will try it on some of the first things we meet in our collection of curiosities: here is one simple enough, you would call it “only a bit of thin scaly crust on a sea-weed.” The Enchanter’s touch is on your eyes, and the scaly crust is visible no longer, but in its place you see a fairy city, whose delicate inmates are housed in transparent cells,

“crowded together for very love,” for surely the expanse of sea-weed was wide enough for them to separate as far apart as they pleased. But there is no fear of their inconveniencing each other, for the cells are fitted together with exquisite precision. It is a city of the dead now; but if the inmates had been in their deserted homes, you would have seen a constant waving of delicate tentacles, as each little Polype came to his door to seek for the daily food which is brought to him, without need of any effort on his part beyond that of taking it in. What is the name of the Polypes? They are *Lepralia*, nearly related to the *Mollusca*, who, you know, are old friends of yours. You can scarcely find a shell or piece of sea-weed that has not a city, or village, or little family of *Lepralia* on it. On English shores alone there are forty distinct species, all different and all beautiful.

Let us try again. Here is a small branch of coral, white and pretty enough without the magic touch, which, indeed, could now do little more than make the dead white look bright and translucent. So we will allow ourselves to be transported by it to the depths of the sea, where the coral-branch is part of the coral-tree, growing in a forest of trees and shrubs of endless variety of form. You do not see the shining white coral with which you are so fami-

liar, for, in this kind at least, the living portion of the tree has over it a soft fleshy covering of various colours. At the tip of every branchlet, or, in some species, from every one of the tiny pores in the branch a star-like flower is expanding its bright petals. But here is none of the repose of the land flowers, which have nothing to do but to breathe out perfume and rejoice in the sunshine. The coral-flowers are living animals, and their petals are busy hands, ever active in gathering in stores from the waters around. You would never think that the clear, sparkling water is the lime-quarry whence the Polype draws all the materials for his wonderful structures, as well as the storehouse whence all his supplies are derived ; but each active little worker knows it well, and knows that his tentacles must not be idle, for has he not, in addition to his own individual needs, the work of assisting to keep up the common body, which connects him so closely to his brother Polypes, as well as of adding his share to the increase of the family tree ?

Let us follow in imagination the results of all this labour. Season after season brings its increase of branch and tree, rising on the fixed remains of the former growth, till at length a coral-reef appears above the waves. Time passes again with all its changes, and we notice a green stain upon the rock,

over which the waves have now ceased to beat. With the Enchanter's aid we recognize one of the earliest forms of vegetable life, a humble little lichen ; which, asking no soil for its sustenance, is content with the bare rock for a home, and with the gifts of the Sunbeams and the passing Showers for food. Slowly and quietly it works its way deeper into the smooth surface, digging the grave in which it is to die, and finally leaves the particles of rock it has detached, to form, with its own remains, a resting-place for the moss which is to succeed it. Generations of mosses appear and pass away, followed by ferns, till at length, after ages have elapsed, a soil is formed where the nobler plants and trees may flourish, and we behold, instead of the coral-grove with its living flowers below the waves, the palms and bread-fruit groves of an island of the South Sea, waving in the summer sun.

Such is the vision, true in each detail, though these may here be grouped without regard to time, which has been called up by the tiny coral-branch. And we do not stop here, but surely must pass beyond even the Southern Seas—beyond earth and sea—up to the Creator of all, who, in His Power and Wisdom, chooses to work His great ends by these minute means !

One more trial still of the Enchanter's power ! Can he give us beauty from this morsel of soft white clay, so carefully preserved here ? What is it, if not common clay ?

So asked the first finders of it when it came up on the sounding-lead from the bottom of the deep seas. And the Enchanter's power did not fail to give the answer :—It is composed of the delicate shells of the *Foraminifera*, invisible creatures abounding now in every sea, as they did in the early days of the world's creation. The man of science heard the answer, and was overjoyed. Well he knows those delicate shells (the long name of which means that they are pierced with little holes), and knows their little makers, and their numerous relations as workers of importance not less than that of the coral-makers, with whom many of them are co-workers in the same wide seas.

There is scarcely a rock, excepting always the impenetrable granite forming the earth's foundation, which does not give to the man of science some tidings of these minute creatures in the by-gone ages of the world's history. He finds deep layers of earth composed wholly of these delicate shells, he knows that great cities are built of the same shells hardened into solid stone—all the gaiety of gay Paris is echoed from walls which are vast ceme-

teries of innumerable millions of these tiny creatures, and the great Pyramid itself—man's most immortal work, and the most impressive memorial of his mortality—has in its stones, no less than in that they conceal, the record of life and death in ages long past! Scarcely less wonderful than these minute animals are the corresponding forms of vegetable life. Plants of transparent glass, or of sculptured and chiselled chalk: are not these subjects only for a fairy tale? Yet the microscope affirms to be simply sober fact.

Let us listen, as the man of science reasons about this discovery that the smooth, soft clay is made of shells, which recently covered living animals:—"We cannot suppose," he says, "that there is life in the sunless depths below the waves, and therefore must conclude that these shells have fallen from the surface, where we find their tiny makers sporting in countless thousands. Again, shells so fragile could not have remained undestroyed in the motion of strong currents, if such existed on the surface where they fell. But the shells *are* perfect, and hence there must be still water at these depths." And what of this? Listen again:—"If we can but sink our telegraph wires in safety they will lie undisturbed in this still water, and then distance will be annihilated between the Old World and the New:

England and America will hear each other speak ! A little more effort ! A little more patience and this must be !” Well may the heart of the man of science fill with joy as the Enchanter’s wand touches his eyes !*

It touches the eyes of the Poet, and what does he see ? A vision rises of the stormy waves at their work of destruction, gathering up at their fierce will the dearest and best of earth’s treasures, entrusted for a while to their treacherous keeping.

“ Red gold and gems ; ” “ the cities of a world gone by,” and yet more precious things than these : — “ Manhood’s noble head : and youth’s bright locks, or beauty’s flowery crown ” — alike swept down by the relentless waves to be hidden away in their secret hiding-places, deep out of the sight of day. And over these the Poet’s fancy sees, falling unceasingly through the still depths, the shower of

* The reader will find a very delightful paper on these interesting organisms in Mr. Gosse’s new book “ Land and Sea.” In this I see, since writing the above, that the most recent discoveries point to the existence of *living* creatures in the sunless depths ; but still, this does not interfere materially with any of the conclusions drawn from the first sight of the “ Deep Sea Shells.”

In the July number of the “ Westminster Review ” for 1862, will be found a very comprehensive article on the *Protozoa* generally, including of course the *Foraminifera*, with full reference to all the best authorities on the subject.

delicate shells, a snow that will not melt, covering, in its soft sheltering embrace, the treasures which will lie, still and motionless, till the time when the sea must give up all its spoils, in that light wherein can be no hidden thing!

Is it not enchantment as wondrous as you ever read of in your fairy-tales that can show all these pictures in a morsel of soft clay? And it is an enchantment which can throw its magic light over everything you see around you, look where you may.

“But we cannot see these wonderful things for ourselves!” says a little voice, in answer to this. No: certainly not, but it is well to know of these wonders, and to desire to see them, for where the desire is strong enough it generally succeeds in finding some means of attaining its object. And in the meantime, you have all of you—at least I hope so—a pair of bright eyes, which may see a great deal, and probably a great deal more than they ever do see now. Among all the many wonderful things in this wonderful world, there is nothing more surprising than the way in which we can go on fancying that there is really after all very little to see in it. I do trust that none of my little friends will make *that* mistake, for it is quite certain that, even for those who may live in the most common-

place little village in the world, there is a great deal more to see than they are ever likely to find out, work as hard as they may in the attempt.

And, as a commencement in this art of seeing, each of you who may have this little history of the Hermit with you by the sea-side, may, just by looking for some of the creatures introduced to you in it, see a great deal more on the beach than you ever saw before—that is, of course, supposing that you are not already little Naturalists; for if you are, you do not need to be told anything of this kind, nor will you in that case need to be told that the Hermit's is quite a true history, every incident recorded being more than “founded on fact.” That is one advantage which it may have over your more exciting story-books, which are only imaginary from beginning to end, so that when you close them you sigh and say, “If this were only all true!” But when you close the pages of Natural History, even when the facts are put in an imaginary setting, you know that it is all true, while many of the wonders are stranger than any mere imagination could ever be.

I am startled here by the imagination of a gruff voice interrupting me, and of the grim face of some matter-of-fact Professor frowning on me as he growls out, “Fine facts indeed! To make all

these creatures engage in conversation with each other, when not one of them has a back-bone, when it may be assumed as a general rule that no creature without a back-bone has anything like a voice. When, in point of fact, the silence of the sea is broken only by the voice of the waves ; in which, however, for my part, I never could hear anything more than the sound, which is the natural consequence of the vibration of the atmosphere, as produced by any kind of motion."

" True, most learned Professor, as far as you go !" is the humble reply. " But I am not aware that I have asserted that these creatures talk in any way that you can understand. And till you can prove to me that you know every single thing in the whole universe, can you prove them to be incapable of speaking some language which you do not happen to know ? In that case, and supposing that I have learnt this language, what is easier than to translate what I hear into my own tongue ? " Whereupon the Professor retires, and I am left in triumph to prose as much as I choose to my little friends before saying good-bye to them.

I do not at all agree with the Professor's theory of language, because it is one of my firm beliefs that there is nothing in the world which has not some voice ; not a stone, nor leaf, nor flower, but has

some message of its own to give us, eloquent with Love, or Wisdom, or Power, if we will only open our ears to it, or rather, I should say, open our hearts to it, for it is to the loving heart alone that such voices can ever speak.

What is it we are to love in order to have the loving heart? We might say, "Love Nature, and you will hear her voice, hear the music to which every created thing adds its own tone." Assuredly, to those who love Nature, whose hearts thrill to every touch of her beauty, there can be no silence anywhere; but yet even those may miss the deepest tones and the sweetest. We would therefore say, "Love Him who speaks through Nature: love the Speaker, and not the voice only!" God speaks to us through the beauty and glory of the outer world, but we shall not hear Him if we do not already love Him.

Suppose that a letter is given to you with the advice to read and study it carefully, in order that you may learn from it the character of the writer, as expressed in it, and so learning, that you may learn to love and admire him. You might learn the lesson well, tracing in every line some sign of love and wisdom, and goodness, till you felt at last: "Would that I could see the writer, and that he loved me!" But suppose that this letter came

from your own best friend, that all you saw in it only reminded you of a thousand loving acts to yourself, would not the reading be a different matter then? And just so is it with the book of Nature, which is a letter from our own best friend, beautiful and dear to us in proportion as we have learned to estimate the privilege given to us of being the children of God. You do not need me to tell you here how we learn this *best* as well as *first* lesson : not from the Book of Nature, full as that is of Love, but from the Book which reveals to us more deeply still the depths of that Love. Great and manifold as are the gifts of God in this outward world, they are nothing to His “unspeakable gift,” in His Son, in whom we may know ourselves to be the children of God. Does it not give you a deeper and happier thought about the beauty of Nature to think of it in this way? Will your enjoyment not be increased a thousandfold, if thus, when you look at the marvels around you, you are able,—

———— “ With filial confidence inspired,
To lift an unpresumptuous eye to Heaven,
And smiling, say—‘ My Father made them all ! ’ ”

It is in this spirit that I hope my readers will learn to think of Natural History : not as a study of dry names and of tedious descriptions, though

these are all necessary and useful in their way, but as a source of living and ever-new delight, for the heart as well as the eyes. Then they will never complain that the days are long and wearisome, that they "don't know what to do," or that their walks are "dull and stupid." When once the eyes are opened, there will always be something to see, wherever they may turn; when once the heart is touched, the eye can never see anything that does not lead its gaze onward and upward, to an Object where it may rest in satisfied thankfulness. "Happy truly to the Naturalist. He has no time for melancholy dreams. The earth becomes to him transparent, everywhere he sees significances, harmonies, laws, chains of cause and effect endlessly interlinked, which draw him out of the narrow sphere of self-interest and self-pleasing, into a pure and wholesome region of solemn joy and wonder."

So says Mr. Kingsley, in "Glaucus," a book which will give you more subjects for thought and admiration than you would exhaust, even if your summer holidays were as long as you would like them to be.

One word more in conclusion, addressed especially to a tender-hearted soft-eyed little reader, whom I fancy I can see finishing the Hermit's History with a sigh, as she says, "Why are the creatures not

more loving and good? they all seem to care only for themselves."

Very willingly would I have recorded only intellectual conversations, poetic fancies, and unselfish feelings, but unfortunately the opportunity was not given to me of doing so, and, if I had invented them, they would not have been facts. You know that very few of the personages of our story are much troubled with *brains*, and will therefore see that we have no right to demand any great intellectuality from them; and though we cannot say that the *Articulata* and the *Mollusca* are quite destitute of *heart*, yet the development of that organ is too imperfect to lead us to expect much of affection or fineness of sensibility from them. We must not assume that *thought* and *feeling* are wholly dependent on the bodily *brain* and *heart*: but still we cannot doubt that the figure of speech which makes the physical organs represent the spiritual attributes is founded on fact; for we know that, as we lose traces of the former in the lower animals, so, as a general rule, do we lose the more lovely qualities which are at least resemblances of the last.

But this is far from being enough to serve as an answer to the question, "Why are these creatures so selfish?" We know too well that, amongst ourselves, brain and heart may be perfectly sound and

active, and that at the same time there may be an utter absence of all thought and feeling, except for self. Think it over for yourself, my gentle little reader, and see if you cannot tell why it is that, though I love unselfishness as much as you can do, it still does not grieve me to know that these creatures, so lovely to look upon, have no moral loveliness, and are wholly selfish. You will soon find a reason, perfectly satisfactory, why qualities which we know to be without excuse in us should not be at all blameworthy when exhibited in "Society under the Waves!"

FINIS.

BOUND BY
BONE & SON.

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