Correspondence.

For the Christian Messenger.

Something about Corals.

BY CARL STEINHAMMER.

Have you an Aquarium? Have you in it a sea-anemone? If you have one, and are familiar with its appearance and habits, you will be all the better prepared to understand what I want to tell you in this little article. But the most of my readers have not aquaria, and have never seen a sea-anemone, and I propose in the following paragraphs, to give them a description of one, together with some account of other animals of the same class, or of the corals in general.

The sea-anemone, as well as the stony coral is a marine animal. These last are most abundant in the Southern seas, but a few rather insignificant species occur off the coast of Nova Scotia, and may be obtained by dredging. Sea-Anemone or *Actinias*, as naturalists call them, are very abundant on our coast, and may be collected in great numbers on the beaches at low tide. They look when the water has gone away and left them, like rounded masses of flesh attached to the rocks or to pebbles, and are not very attractive objects.

Remove one very carefully from the rock, or take up one attached to a pebble, which is much better, put it into a bowl of sea water, and watch it. It begins very slowly to expand, very slowly it begins to throw out from the top a number of very delicate feelers, that creep out softly, until, from a dome shaped, irregular fleshy mass, it has become a cylindrical body, flat above, and crowned with a most graceful wreath of innumerable soft, delicate tentacles, highly tinted in some species, like the petals of a gorgeous flower.

Within the wreath of feelers is an oblong opening, which leads into the digestive cavity, and which we may call a mouth, bearing in mind, however, that it does not correspond at all to the mouth of the higher animals, for the sea-anemone is a radiated animal, like the medusa or jelly-fish which I spoke about in a former article, and, like it, built upon an entirely different plan from either Mollusks (*shellfish*), Articulates, (*worms*, *crustacea* and *insects*) or Vertebrates (*fish*, *reptiles*, *birds* and *mammals*).—Around the mouth is a space without tentacles. Such is the general out side appearance of a sea-anemone. It is, when fully expanded, a beautiful object. See how slowly it contracts and lengthens the body, changing its shape constantly, now stretching up into a long cylinder, and now shrinking down close to its seat on the pebble, while all the time the tentacles are waving with a graceful motion. Touch it with your finger and it contracts, doubling all the wreath of feelers into the upper part of the body, concealing them entirely, becoming the shapeless mass it was before.

When it has expanded, put into the bowl one of the little crustaceans so common on the sea-shore under sea weeds and stones, (*Gammarus minutus*) and which are commonly called "sand fleas;" it goes swimming about the bowl, darting from side to side with great activity, but let it come in contact with the tentacles of the Anemone and it falls paralysed. The tentacles are armed with a multitude of extremely minute cells, each of which contains a little thread coiled up spirally within. These cells are so extremely minute that they are visible only under a microscope of the highest power. They are called *lasso-cells*. When the little crustacean came in contact with the tentacles of the sea-anemone, it was pierced by the innumerable threads from the lasso-cells and killed. When a sea-anemone is roughly handled or injured, it throws out through openings in the body, long white threads made up entirely of lasso-cells. I have seen minute animals killed by coming in contact with them. These weapons of defense are called *Acontia*. Jelly-fish are furnished with lasso-cells, and the stinging, burning sensation experienced on handling one of the larger kinds with long tentacles (*Cyanea artica*) is caused by the piercing of the hand by their innumerable threads.

The construction of these animals is extremely simple. If you were to cut one across, you would find that the body was composed of a leather-like sack, with another smaller sack suspended within it, while the whole space between the two sacks was divided into chambers by thin walls of membrane extending from the upper to the lower part of the cavity,—and radiating like the spokes of a wheel, from the central sack to the outer wall of the body. I wish I could make this plainer by a wood-cut; but I can tell you how to make a drawing that will answer the purpose very well. Draw a circle of, say an inch in diameter, which will represent the body wall of a small actinia, as seen in a transverse section of the animal. Now divide the space between the two circles by lines radiating like the spokes of a wheel, leaving the central space free from lines. Make some of these lines reach only part way from the outer circle to the inner. The smaller circle will represent the inner sack, which is a sort of stomach, while the radiating lines represent the partitions. Some of these partitions reach from the body wall to the stomach, while some are so narrow that they do not reach it. There is a tentacle for every chamber between these partitions. These tentacles are hollow and communicate freely with the cavity of the body.

The food entrapped by the tentacles is taken into the mouth and in the sack-like stomach undergoes a sort of digestion. When mixed with sea water, it is passed through an opening in the bottom of the stomach into the general cavity of the body, where it circulates freely about, passing into all the chambers, and all the tentacles, carrying nourishment to the animal. Any refuse left, is thrown out at the mouth opening.

On the edges of the partition walls are developed bunches of eggs, which escape through the mouth.

Such is the Actinia or sea-anemone, the lowest member of the Animal Kingdom. It is, you see, a mere sack with another sack suspended within it; the second, acting as a stomach. It has no brains, no heart, no circulatory apparatus of veins and arteries, and no eyes, though some actinias have at the bases of the tentacles colored spots, which are homologous to the eyes of the *Aurelia*. What a strange animal it is!

The common idea is, that corals are structures built up by insects, very much in the same way as the bee builds its comb. This is very erroneous. No insects live in the sea, and the animals of which these coral structures are a part, are not insects, but belong to the class of Polyps, of which our sea-anemone is also a member.—They are animals of essentially the same plan and the same mode of execution, only that they deposit in the walls of the body, limestone particles, so that they become hard and solid like rock, while only the upper part of the body, the tentacles, and the stomach remain soft. The coral is a sort of skeleton which grows within the animal, just as our bones grow within us, and it is in no way formed like the cell of the bee, which is made by the bee itself, and is no part of its body. Even the partitions have thin plates of solid matter deposited within them.—If you examine a piece of common coral you will find numerous cells opening at the surface; in these you may see the radiating partitions very distinctly.

There are two great divisions of Polyps.—One, *Zoantharia*, in which the polyps have tentacles, like Actinia, simple, unfringed, and in number six, or some multiple of six. These are either like the sea-anemone, without solid parts, or building a solid limestone skeleton. The other, and higher division, *Halcyonaria*, comprize such polyps as have only eight tentacles, and these ornamented with fringes. These polyps have for the most part skeletons, which we know under the name of "seafans" and "sea feathers," (*Rhipidogorgia Ptersgorgia* &c).

Corals multiply not only by means of eggs, but by *division*, in which the animal separates into two distinct animals, and by *budding*; in which case the young animal buds out from the side of the parent, just as a bud grows on the branch of a tree. This is the way in which the common hard corals grow. A young polyp springs from an egg; this one gives off buds, which themselves as they grow, bud again and again; but they do not separate from one another, all the individuals composing a community thus formed, remaining organically attached the one to the other, in so much that in very many instances what one eats goes to nourish the whole community.

In each individual as it grows, limestone particles are deposited, and thus the whole community is firmly soldered together. Many of these communities number tens of thousands of individuals. The hard parts are, when the coral is alive, entirely within the animals. Owing to the different mode of growth of the different Families of Polyps, the hard parts take different forms.

In the common *Madreposes* of the West Indies, which are so often seen as parlor ornaments, they are branching like the antlers of a stag.—In the *Fungias* of the East Indies, that do not form compound communities, they are flat and disk-like, and strongly resembling mushrooms turned inside out, whence the name. In the Brain-coral or *Meandrina*, they form large dome-shaped masses, and the polyp-cells are elongated and winding. Meandrina is one of the numerous polyps, which multiply by fissuration or divisions.

In the higher order of polyps, the Halcyonoids, the base of the animal secrets a horny or calcareous substance, while the upper part secretes a spongy calcareous mass. The former serves the community as an axis, while the latter forms a thick coating round it, pierced by the innumerable polyp-cells. The "sea fans" and "sea feathers" are examples of this order.

There is a very strange coral (Renilla) found near Charleston, South Carolina. It consists of a flat, hollow, membraneous, heart-shaped disk, which is a colony of polyps that are able to move about together by a retractile locomotive organ, attached to the disk like the stem to a leaf. This one locomotive organ has to be used by the whole colony. In order to move in a certain direction, all the polyps must be of one mind, for they have only this one leg, if we may call it such, among them all, and they must all agree as to the direction in which it is to be used, else they make no progress. What a lesson they might have taught the rebellious Southerners, had they but given heed to it! Some fabulist ought to go down there, like as they did in Greece in olden time, and teach them the benefits of Union!

Other polyps colonize structures of various forms, some being arrow or pen-shaped. They are able to move about together, probably by the expansion and contraction of their stalk-like appendages, though some say that they dart about together in the water by the action of fin like organs on which they are clustered, but this is doubtful.

We get a very inadequate idea of the coral forest, from the fragments of dried corals we see, for these are but dried decayed twigs, mere skeletons. The polyps are more or less brilliantly colored when alive, and the living coral is a most beautiful object.

The following lines discriptive of a coral-forest, have at least, the merit of being zoologically true, and as they give, I think, a fair idea of its appearance, I offer them for your perusal:

Like trees of foliage stript, and clothed
With softly tinted mosses all abloom
With myriad starry florets, brightly hued,
As gems on which the sunbeams fall,
And, breaking, scatter in rayed lustrous stars,
Flashing with warm rainbow tints. Such are the forms
That tree-like stand around. Stout trunks
Rise high the ground above, and wide
Throw thickly-woven branches out,
No breezes sway them, motionless are they;
Beneath the ocean-gale the coral-forest never bends.
How lovely they, with flowers encased
Each flower a living polyp, while
Gay algæ pendant from their boughs
Wave out their streaming fronds!
And like as ferns and shrubs and mosses gay
Carpet the floors of forests on the land,
So in this forest of the sea, rich moss-like forms
Carpet the knolls, and plumy sea-ferns weave
Thickets as tangled as in sylvan groves.
Here is no song of birds, but gilded fish
Flash as they swiftly dart the sunlight from
Their brilliant sides. Now swallow-like
They wheel and swoop, or, poised on steady fin
As humming birds before some floret gay, float motionless.
Here Nereids gather pearls and shells, as in the wood
The maiden gathers flowers, and their palace grots,
Deck they with coral boughs, and with festoons
Of foliage of the sea.

Museum of Comparative Zoology,
Cambridge, Mass., June 13th, 1863.

For the Christian Messenger.

Report

OF THE SABBATH SCHOOL CONVENTION OF THE CENTRAL BAPTIST ASSOCIATION, AT UPPER AYLESFORD, JUNE 20, 1863.—D. FREEMAN, SEC'Y.

In presenting our report to this Convention we are more and more impressed with the importance of the Sabbath School institution. In our accompanying tabular statement we have an aggregate of 28 Sabbath Schools. 1788 pupils. 274 Teachers. 196 pupils in bible classes. 126 scholars who are members of Churches; 22 Libraries containing 4630 volumes, and $333.43 expended in these schools during the past year.

In view of these facts we must feel that a mighty agency for good, is working in our midst. It becomes us therefore to ponder well the *agency*, and the *object* to be secured.

First. Our opinion is confirmed by the history of Sabbath School effort, that the *Spiritual enlightenment* of the pupils is the great design of the Sabbath School. This result assumes a two-fold aspect according as we contemplate the *conversion* of the soul, or the *edification* of the young convert in the principles of the Gospel.—In the Sabbath School, intellectual training should be wholly subordinate to the salvation of the soul. Least of all, should mere amusement there, take the place of spiritual instruction.—We would fortify this position by facts. We should consider that the young mind is a more promising field of labor than the adult mind.—"Train up a child in the way he should go and when he is old he will not depart from it." It is also a fact that since the youth have been brought under evangelizing influences, many, if not most, of the useful characters in the churches can trace their conversion to childhood. Furthermore it is worthy of notice that conversions in Sabbath Schools are beginning to be matters of frequent occurrence. The report from Falmouth school says: "One of our little boys was baptized in January." How often in the history of the Sabbath School, has it been shewn that "a little child shall lead them." In the North Baptist School, Halifax, the report says:—"During the year, three pupils from the bible class, and two from the school have united with the church by baptism. May the Lord grant that the seed sown may bear much good fruit, and His name shall have all the glory." In the first Cornwallis Church, a considerable number of pupils have been added to the people of God. In the fifth Cornwallis Church, the same hallowed scenes have been witnessed in connection with the pupils of the Sabbath School. In Pereaux, seventeen pupils and three teachers have been added to the church, and more are pressing into the kingdom of God. In this place a blessed revival commenced among the small children of the Sabbath School. From these the work spread to the parents, and the adult population generally. Some of these little disciples, after being a few weeks in the enjoyment of religion, seem to exhibit all the firmness and ripeness of the aged christian. One dear little boy invariably takes up his cross in the house of the Lord. Though scarcely tall enough to speak over the back part of the pew, he rises and tells the people how much he loves the Saviour. The same may be said of several others. Amid such scenes how appropriate the declaration, "Out of the mouth of babes and sucklings thou hast perfected praise."

These facts, like finger boards, point us in the way to the weak places in the ramparts of the enemy. The young heart is the weak point in the wall of Satan's kingdom. Here, too, may be built up the strong fortifications of holiness. Here we may fortify the Charleston, the Vicksburgh, and the Gibraltar of the christian church. And who will say that the prosecution of this spiritural war is not as important as the independance of the Southern States, or the integrity of the Northern, or the guarding of the entrance to the Mediterranean Sea? Who will say that the cause of Sabbath Schools is not as important and worthy of as much zeal, as the founding of earthly kingdoms, since its special design is to establish the Spiritual Kingdom of Christ.

Second. But how shall the grand design of the Sabbath School be realized? What means shall be adopted? This question is important, because it is evident that such measures may be adopted, as shall thwart the object comtemplated. It is needful for us then, not only to keep in view the real object of the Sabbath School, but also to give good heed to the *means most appropriate* to that design. The instrumentality to be used is the *Bible* and the Bible alone. The power to be invoked is the *Holy Spirit*, and He alone.—We take this for granted without argument to establish it. The same means are to be employed in the Sabbath School as in the pulpit. The Sabbath School teacher is a preacher of the gospel. He has a smaller congregation than the minister, in that he preaches to half a dozen instead of a hundred. But he has this advantage, that he brings the truth in contact with the individual mind of his pupils. His congregation, too, may be changing, as he has his pupils under him only for a few years. But then if the Lord blesses him, he feels that he is constantly sending forth those who are imbued with his own spirit, and will who engage in the same work.—Thus during a lifetime, from his class, he may be pouring a stream of life and a flood of light upon the world. And the teacher will be successful in proportion as he plies the Word of God, and relies upon the power of God. This is his great qualification, personal piety, involving a missionary spirit. Without this, all external arrangements will be mere bombast. There may be a glitter, but there is no substance. A noise, but it is like "sounding brass or a tinkling cymbal." If we can have but one, either the most perfect arrangements, or the Spirit of God working in the school, give us the latter. Let God be working, and the school will be invested with a charm, that men and women and children cannot resist.

Yet, certain arrangements may be made in perfect harmony with the divine operations.—But it is evident that those arrangements must be in perfect accordance with the end to be secured—salvation; and with the means to be employed—the Word and the Spirit of God.—Keeping these principles in view, we may en-