

great misery that Bell loved somebody better than she loved me. What she had said about money had not disturbed me, for I did not believe she meant it; that was only banter intended for Nattee. And yet the thought *would* come, was Bell mercenary? Oh! I would rather a thousand times endure the bitterest pangs of jealousy than think that Bell could be influenced by the motives she had announced. No, no, she did not mean that. She was in love with Dr. Rossitur; unaccountable as it seemed, it must be true. She loved him more than she loved me. My heart was wrung with these tormenting feelings, and I was very far from the kingdom of heaven at that time. I felt as though the very spirit of evil was let loose upon me, but I sat quite still, apparently unmoved, and listened to the chatter, and then answered Nattee's last remark coldly.

"If all you want is to wear a camel's-hair shawl, you can do that now, if you've got one."

"Indeed no!" cried Natalie, with real enthusiasm, for etiquette was her religion.

"It *cannot* be done so, Bessee." When she was excited she always spoke with a slight accent.

"French ideas," I said scornfully.

"True ideas," she cried. Surely, Bessee, you would not wear a cashmere if you were not married?"

Bell began to laugh. "Bess will not wear a cashmere now nor ever. She will never get the chance. She will marry a parson, and wear narrow, short, black skirts, that will always need a quarter of a yard more than they have. She will save the money and material and give it to the poor. Oh! yes, Bess shall marry a parson."

"I'll marry no man!" I cried, in a voice that was husky, although I tried to laugh.

"She shall preach when the parson has a sore throat," continued Bell. "You and I will come to hear her, and wink at her from the front pews. She will have to cook his dinner, and make his gruel, and tie up his throat in red flannel."

I did not mind this nonsense, my heart was too full.

"Tell me," I whispered to Bell, as we all rose to saunter through the garden, "tell me you did not mean what you said just now."

"About the parson?"

"No! no!"

"About the narrow skirts?"

"No! no!"

"About getting married?"

I nodded.

"No, I'm not in fun, I do mean it," said Bell quietly.

My heart bounded. "Bell," I said, earnestly, longing to add the question I dared not ask.

"Come on," cried Natalie impatiently.

"You don't love him more than *me*?" I asked breathlessly. But Nattee drew Bell away, and I threw myself down on the sunny terrace and broke my heart all alone.

(To be continued.)

## Gone!

BY ROSE GERANIUM.

HE hath gone fast to sleep,  
Idle her white hands rest;  
Never to wake or weep,  
Stirreth her breast.  
Swift thro' the wilds of night  
Fled her spirit from sorrow,  
Into God's boundless light—  
Heaven's to-morrow.

ONE in the morning light,  
Fled with the winged dew;  
Gone! e'er the sense or sight  
Found earth untrue!  
Sickness shall vex no more;  
Sorrow shall pain her never:  
Safe on the bosom of God  
Resting forever!

## Common Sea-weeds.

BY LIZZIE P. LEWIS.



EW studies afford more instruction, or are attended with more genuine pleasure, than that of the algæ; and this is not due simply to the boundless wealth of form they exhibit, nor on account of the inexhaustible material they afford the botanist for observation and comparison. The main point of interest is, that by a close investigation of the conditions of life existing in the algæ, we are enabled to obtain a true insight into the structure and functions of higher plants.

Let no reader who is at a distance from the sea-coast fancy she can have no share in the delights arising from this branch of natural science, for algæ are to be found everywhere—often, indeed, where the superficial observer would scarcely expect to find even the smallest trace. Wherever water collects—in sea or lake, river or pond, even in the tiniest ditch or puddle, often on the face of a damp wall—there algæ thrive and invite the attention of the student. The writer has a specimen of fresh-water algæ (No. 1), which she fished out of the Paolina Fontana, in Rome, one bright spring day, and which is identical with another gathered only a few days since from a running stream in Westchester County. The delicacy and beauty of these graceful, feathery plumes can hardly be equaled by anything in nature.

But it is with the marine algæ that we have most to do in this paper, whose beauty of form and coloring have not only made them favorites with botanists, but with many persons for whom botany, as a science, has no charms. They are to be prized, too, not for beauty alone, but for utility as well. In the vast ocean, whose every wave contains living creatures countless as sunbeams, dead animal substances lie or float, whose putrefying remains would

spread poison on the air around and above the sea. The sea air, which now brings health on its breezes, would carry disease and death, were it not for the scavenger-like animals which prey upon its refuse, and for the sea-weeds which, with continual and rapid growth, cover every part of ocean's bed. Their tough and woody stems, often crowned with gigantic fronds or leaves, assimilate to their own support the masses of putrescence arising both from this source and from the substances carried from the shore by every tide. And so the lovely plants of the sea aid the ebbing and flowing of the tides and the saltiness arising from deposits of saline matter in the channels of the deep, to change what else would be evil into good, and to spread wholesome air instead of poison.

Botanists divide sea-weeds into three great groups, the olive green, the red, and the green. We may find specimens of the coarse olive-green weeds, the *melanosperms* of the botanist, at almost every season of the year. The most common of these the bladder fucus (*Fucus vesiculosus*). When fresh it is dark olive in tint, but if left in the sun for a little while it becomes black as ink. Its fronds, when growing near the shore, are about a foot long, but found in deep water, they grow to the almost incredible length of five to eight hundred feet. They are abundantly supplied with air-vessels, by means of which they wave about on the surface of the water. At the Falkland Islands they grow to such an extent as to be called sea-trees, and at Port Stanley the weed is so thick in some parts of the harbor that it is almost impossible to row through it. The common name of this fucus is bladder-wrack or kelp-wane. It is much used in the British Isles for manure, and along the coast as food for cattle. Its bladders yield iodine, the quantity of which varies according to the climate in which the plant grows.

Another common fucus is the prickly tang (*Fucus serratus*). This often covers the rocks to the limit of low water, its fronds varying in length from two to six feet. It to be distinguished from *Fucus vesiculosus* by having no air-vessels, and by its notched or serrated edges.

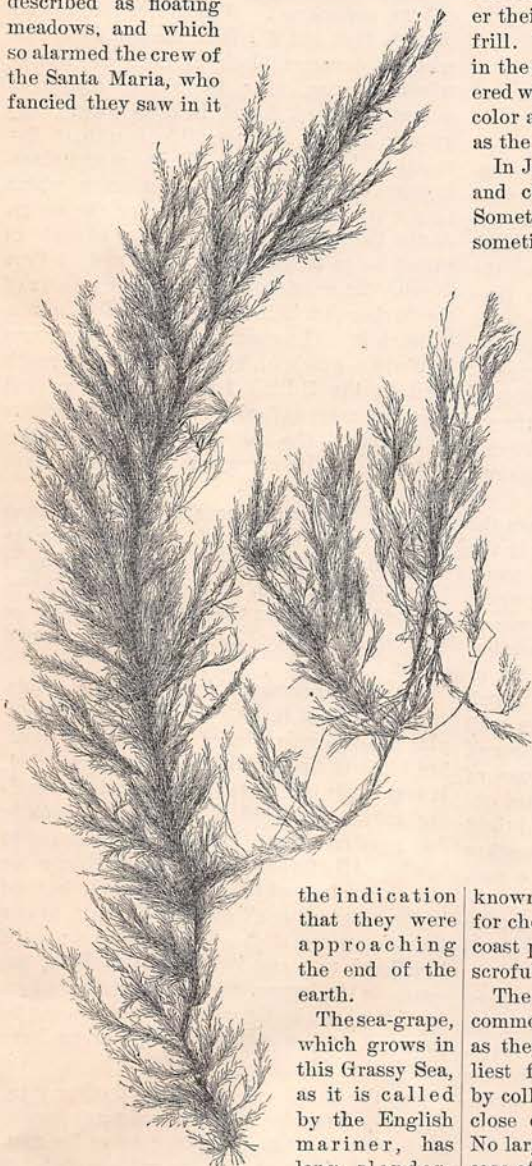
Yet another common kind is the *Fucus nodosus*, or knobbed fucus. It is a thick, leathery plant, olive green, almost yellow when fresh, but black and polished like ebony when dried. It may easily be known by its long stem, swelling into large bladders an inch in length in fine specimens, and looking like a string of beads. All of these species, as well as some others, are burned for kelp or soda, to be used in the manufacture of glass and soap. At one time the preparation of kelp was a source of livelihood to many in the British Isles, but owing to the improvements in chemistry during late years, by means of which soda can be procured at less cost, the kelp-burners have now little to do.

But the fuci have a variety of other uses. The poor Icelander makes use of many species for food, while the commoner serve for mattresses. In Holland, bladder and serrated fuci are used for packing fish for exportation, and the bladder-wrack is greatly in vogue in Scot-

land as an outward application for glandular swellings. In the Channel Isles, these weeds are not only used as a fertilizer in their fresh state, but the ashes are carefully spread over the soil, after the weeds have been burnt for fuel. Rarely, indeed, does a coal fire glimmer in the stove of a Jersey farm-house, for seawrack makes a hot though not a cheerful fire, and as the ashes are useful, the fire is suffered to burn by night as well as by day.

Most sea-weeds have some kind of root or means of attachment to the soil or rock on which they grow. This is merely a continuation of their leafy substance, the fixed end of the plant swelling out when it roots itself. But there are a few species which have no point of attachment, but grow in floating masses in the open sea.

The gulf-weed is one of these. It has been found in almost every part of the world, and an immense tangled mass covering a space of fully 40,000 square miles floats in the Atlantic just within the great equatorial current. It must have been this Sargasso Sea which Columbus described as floating meadows, and which so alarmed the crew of the Santa Maria, who fancied they saw in it



1.—FRESH WATER ALGÆ (*Lemna*), FROM THE FOUNTAIN PAOLINA, ROME.

the indication that they were approaching the end of the earth.

This sea-grape, which grows in this Grassy Sea, as it is called by the English mariner, has long, slender, olive-green leaves, and ber-

ries about the size of a pea. Sailors call it midshipman's pickle, because it is pickled in vinegar and eaten on shipboard.

There are two varieties of weeds which curiously resemble those gray crusted lichens which hang about old trees, and which have been named lichina in consequence. The dwarf lichina grows on sea-side rocks, and when the tide is out and it is dry, becomes a hard black crust; but the returning waves restore it to its original olive tint, and render it soft and flexible. The other forms close tufts on rocks never inundated by the waves, but only sprinkled by the spray at high tide.

The sweet laminaria (*Laminaria saccharina*) has fronds from four to five feet long and from four to five inches wide, on a thick, tough stem. In young plants they are like thin flat leaves, but when older their edges are puckered like a frill. When washed and hung up in the sun to dry, they become covered with an efflorescence, white in color and not agreeable to the taste, as the flavor is both saltish and sweetish.

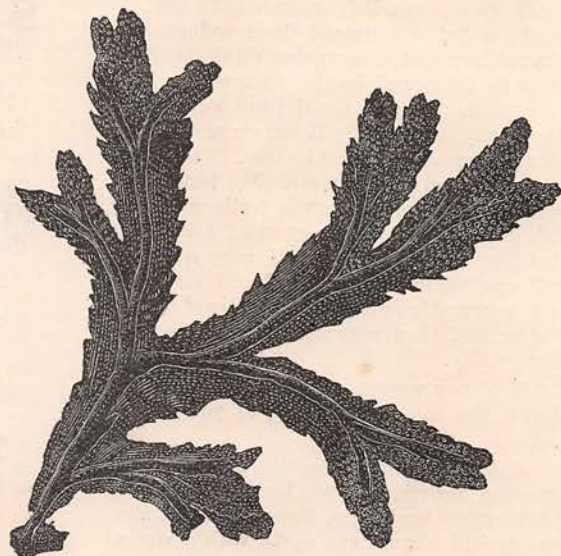
In Japan it is called komb, and when dried and cleansed is used for several purposes. Sometimes it is cut into strips and boiled; sometimes it appears on the table uncooked, after being well scraped and cut into slips two inches long, and folded in squares. When presents are made, the complimentary note which accompanies them is often tied with a slip of this weed about an inch broad, perhaps to signify that the resources of the sea are free to those who choose to avail themselves of its benefits.

The tangle or fingered oar-weed (*Laminaria digitata*) has a long flat leaf, which after its early stage separates into a number of segments like ribbons, from the point of the leaf to within a few inches of the stem. This weed makes an excellent barometer when taken inland, as it affords a good indication of approaching rain by its damp, flagging state when the atmosphere is moist. This plant contains a larger quantity of iodine than any sea-weed known, and the stems are much used for chewing in the South American sea-coast provinces by persons affected with scrofulous troubles.

The red sea-weeds, or *rhodospirms*, are more common in seas of the temperate zones, and as they exhibit marine vegetation in its loveliest forms, are sought for with eagerness by collectors. But most of this family need close examination to discover their beauty. No large masses cover rock or shore as in the case of both the olive and the green varieties. They court the shade, and will not grow if exposed to much light or air, being most vivid

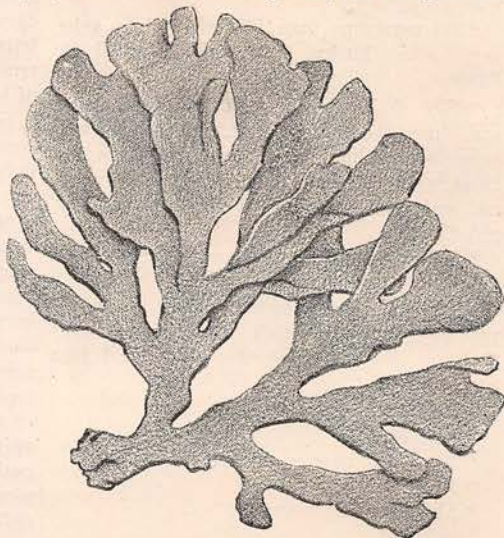
in color when sheltered from the sun's rays in some rocky pool.

The commonest of red sea-weeds is the hair-flag or *Plocamium coccineum*. This name is derived from the Greek word signifying



2.—FUCUS SERRATUS.

hair, but it is not a very happy appellation, for finely divided as is the frond, it cannot be said to resemble hair. The frond grows in tufts, very bushy and branched, the main stem irregularly divided and seldom thicker than a coarse thread. All the smaller branches are set with uniform little branchlets. These produce two series of three or four tiny branchlets from the upper edge, and sometimes a third or fourth even occur, each less than the preceding ones, but always of the



3.—FUSTRA FOLIACEA (*Zoophyte*).

same number and always from the upper or inner edge.

A sea-weed which soon darkens so as to resemble one of the olive-colored sea-weeds, after being taken from the water, is the much branched forked furcellaria (*Furcellaria fastigiata*), which grows on rocks and is found scattered profusely on the shores of temperate zones after a storm. It is of a pale pinkish purple, rather rigid, and becoming quite crisp as it dries. In

the summer, it is generally half-covered with a sand-colored crust which is in fact a zoophyte, this crust being the home of many minute polyps.

Another lovely seaweed called the feathery ptilota (*Ptilota plumosa*,



4.—PTILOTA PLUMOSA.

No.4.) resembles a pink feather, having branches feathered with little rays or pinna, opposite to each other on the main stem. The finest specimens I have ever seen have been found in the Orkney Isles, some of them being a foot in length, and completely covering a large folio sheet of paper. When left to dry on the beach, the plant first turns violet, then a brick red, and lastly green.

One of the thickest and most substantial of red sea-weeds and one very easy of recognition is the Esculent Iridae. This is much used in the Orkney Islands and in Scotland as a vegetable. It is also eaten by the fishermen on the southwest coast of England, and is said to have the flavor of roasted oysters when pinched with red-hot irons. The leaf is thick and fleshy, flat and veinless, with the upper part somewhat egg-shape. When young it is very pretty, and if laid to macerate in water it tinges the liquid a fine purple tint.

One genus of marine plants has been named Griffithesia, in honor of an English lady whose investigations have done much for this branch of natural science. There have been more than thirty species of Griffithesia discovered, some in the waters of Australia and west Africa, and the Mediterranean Sea. The *Griffithesia corallina* (No. 5), found at that "happy hunting ground," for sea-weed lovers, the Isle of Wight, is of a bright pink-color, with darker shades at the joints. One peculiarity of this genus is, that when taken from the water it projects minute globules of liquid to a distance of several inches, making as it does so, a crackling noise not unlike the sound caused by throwing fine salt on the fire. One very interesting fact is noticed in one species of the Griffithesia, which grows on most of the rocky shores of the Atlantic, from high northern latitudes to tropical regions. When viewed through a microscope its blackish purple tufts display strings of small pear-like substances, beautifully and symmetrically disposed, each marked with a white cross, surrounded by a rich red color.

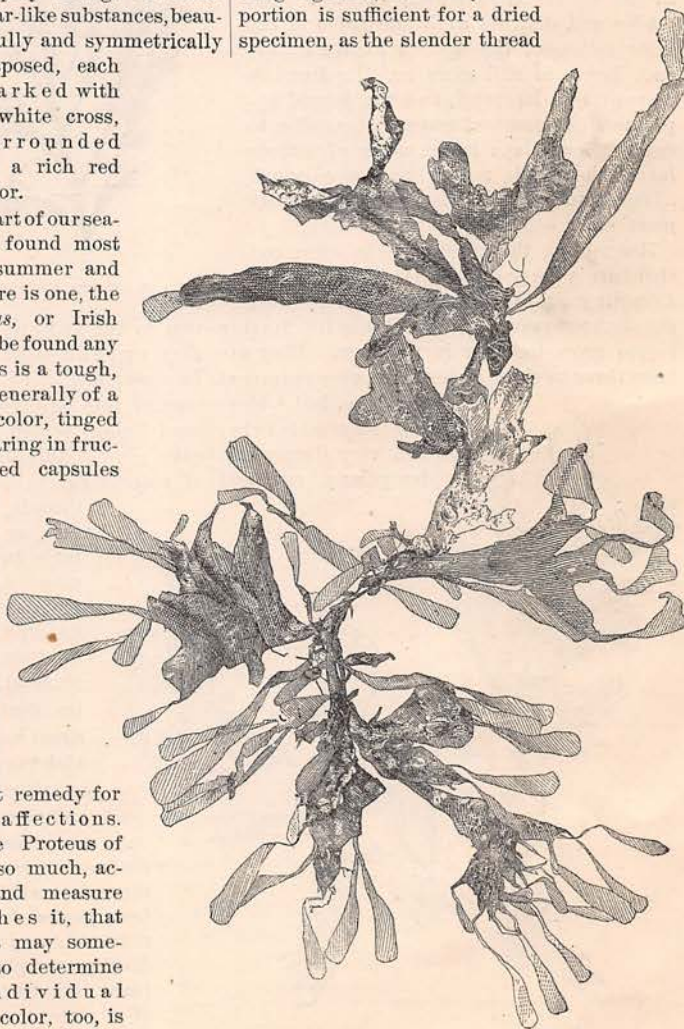
The greater part of our sea-weeds are to be found most abundantly in summer and autumn, but there is one, the *Chondrus crispus*, or Irish moss, which can be found any time. This moss is a tough, leathery weed, generally of a purplish-brown color, tinged with red, and bearing in fructification rounded capsules imbedded in the frond, forming small hollows on one side, and corresponding prominences on the other.

This moss is very nutritious, and if boiled into a jelly and made palatable by the addition of lemonade juice, is an excellent remedy for coughs and pulmonary affections. It has been called the Proteus of the algae, for it varies so much, according to situation and measure of light which reaches it, that an amateur botanist may sometimes find it difficult to determine to which species an individual plant belongs. Its color, too, is variable. When growing in a

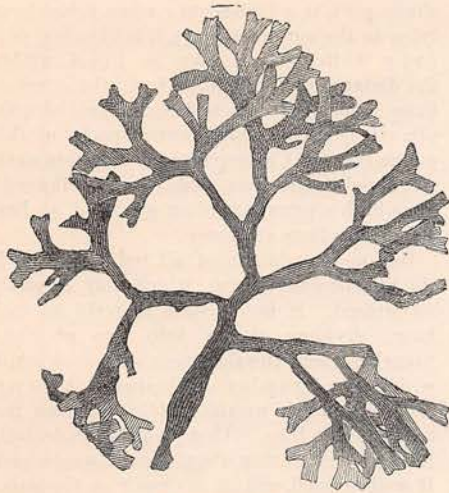
shady pool, it is iridescent; when it has been lying in the sun a few days, it is bleached perfectly white, and it may be found within the distance of a few miles in all the intermediate shades between white and reddish purple. It is from an East Indian species of this genus that the Chinese birds make those nests so valued in the East, and which, being sold at so high a price, are often procured at hazard of life from sea caves.

But most exquisite of all red sea-weeds is the blood-colored fucus, which may be easily recognized. It has a stem scarcely an inch long, dividing thence into two or three branches about the thickness of a crow-quill, which bear a number of shining pink leaves, each with a vein up the middle, and from five to six inches long. This plant is wonderfully lovely when waving about in the water, and, if well pressed, will lie so closely on the paper that its elegant, transparent, wavy leaves resemble a beautiful painting.

We have all seen rocks covered with what a vivid imagination could fancy to be the grass-green hair of a sea-maiden, rendering them so slippery as to be frequently unsafe for walking. This *Conferva lacteviseus*, with its bushy, yellowish-green tufts, is to be found in great profusion at almost every season. If we gather a tuft, the fibers hang together, but a very small portion is sufficient for a dried specimen, as the slender thread



5.—GRIFFITHESIA, FROM THE ISLE OF WIGHT.

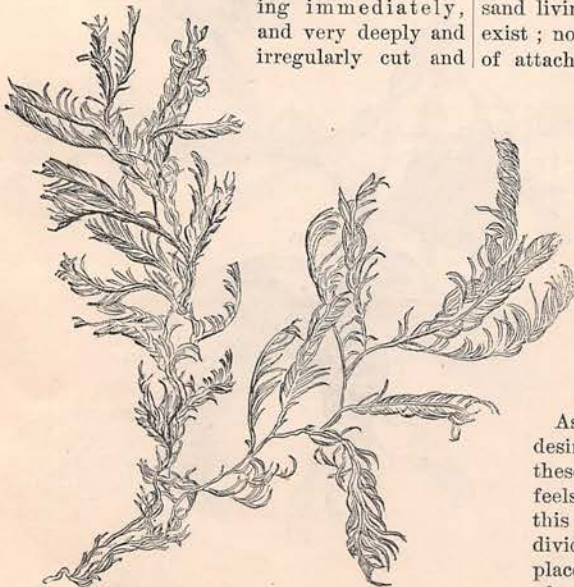


6.—CHONDRUS.

may be easily laid out so as to cover a large sheet of paper, like a miniature green tree.

The ulvæ, or lavers, are flat, green, transparent leaves, which, when laid on paper, are scarcely thicker than gold beater's skin. The broad, green laver has a broad, ovate, glossy leaf, and, as it waves up and down in the water, is extremely elegant. But tender and delicate as is the frond of the *Uva latissima*, the species known as lettuce laver, is still more so. Its frond is more or less lacerated, and the jagged appearance it presents, somewhat similar to endive, has given it the name of lettuce laver, though it really has not so much likeness to salad as the laver previously mentioned.

Resembling the green laver in form and structure is the porphyra, or true laver. It is a fragile weed as it clings to our finger as if the slightest movement would rend it. Its thin leaves grow together in numbers. They are from three to eight inches long, very narrow at the base, but widening immediately, and very deeply and irregularly cut and



7.—PLUMULARIA FALCATA (Zoophyte).

waved. It is a useful plant, much eaten in Scotland, where it is called sloke kale. When prepared for the table it is first pounded, then stewed and served with pepper, vinegar, and butter. In England it is usually kept in brine and stewed with oil and lemon-juice.

There are large genera of the *chlorosperms* which must be left unnoticed, but we will describe one object constantly being thrown up by the waves, which is frequently mistaken for a sea-weed, but is really a zoophyte. This large, horny, brittle substance, the color of moist wood, is the broad-leaved Hornwrack (*Flustra foliacea*, No. 3). If held up to the light, we can see plainly its cellular structure. When placed under a microscope, we can see that the upper part of the margin of each cell is armed with four projecting horny spines, which appear to be designed as a protec-



8.—DASYA COCCINEA.

tion to the polyps when they extend their arms. In a common sized specimen of this hornwrack, at least thirty thousand living beings have been computed to exist; nor is this all, for it is often the point of attachment to other corallines—minute threads, which creep over its surface, or crowd upon it in dense little tufts, or cover it with a mossy looking substance, like a coating of down. It has a peculiar odor, and when freshly thrown up from the water, is often very pleasant. One writer compares its scent to that of the orange; another, to the perfume of violets; another, describes it as mingling the perfume of rose and geranium.

As every wanderer on the sea-coast desires to preserve some specimens of these beautiful objects, the writer feels that a few words of advice on this point may not be amiss. After dividing the plants into fitting portions, place each tuft separately on the edge of a plate, not in the water, but just on the side, so that it may imbibe a

sufficiency of moisture during the operation—without being actually immersed. Next, let a piece of stout white paper—smooth drawing paper is best—be pushed under the water slowly and carefully, so as to prevent air-bubbles from pressing on the lower surface, as they are very apt in the subsequent treatment to cause an unequal expansion of the paper, thereby causing folds and wrinkles. The paper being ready to receive the alga, the latter may be drawn gently over it, with the root-end toward the operator, the stem and branches kept from entanglement by means of a smooth blunt needle, due regard being had to their natural position during life. As soon as the larger branches are laid in the right direction, attention can be given to the minor branches or pinnules, the position of which is in a great measure regulated by the way in which the paper is drawn out of the water, across the edge of the plate. If this is done deliberately, the tiniest even of the branchlets and filaments will fall into their proper shape.

This done, the specimens must be submitted to a drying process, and for this there is nothing so good as smooth white absorptive blotting paper. Place them in layers with several sheets of blotting paper between the specimens, place the whole between two smooth boards and weight it down with bricks or anything else convenient. Every day the blotting paper should be changed—in fact, the oftener a change is made in the absorptive material, the better, as it tends to preserve both the coloring of the specimen and the clean appearance of the paper on which it lies.

When changing the drying paper, the best plan is to turn the whole pile upside down, so as to get at the lowest specimens first. Carefully remove the first layer of damp sheets, taking care not to lift with them the piece of

white paper attached to the specimen. Lay the latter on a fresh stratum of blotting paper, and so proceed with each specimen, loading the

whole as before with bricks. In proportion as the moisture is got rid of, the drying material must be reduced in

quantity, until a single sheet only is left between each specimen. In this state the pile should be left for several days, until the plants lie quite flat and all danger of their curling up is past.



9.—PORPHYRA LACINATA.