

As the stem is very apt to decay an inch or so from its base, and thus increase its natural fragility, the difficulty of collection is great, and calculated to try the patience of any one who may happen upon this interesting fungus at the end of a day's trip, and try to get good herbarium specimens of it in his last ten minutes of disposable time.

SEaweEDS IN WINTER.

F. S. COLLINS.

THE greater part of the collecting of algae, as well as of higher plants, is done in the summer months, or at most in the period between the spring and autumn equinoxes, and it will probably surprise those who have not already investigated for themselves, to know that the life and growth along the shore are continuous. On land the lichenologist can always find employment, and the bryologist may find fruiting mosses during the winter months, but of other land plants one finds only the memory of the past or the hope of the future.

But not much below high-water mark the condition changes, and at low-water mark winter seems to have no influence whatever. On the first day of January last, I was at a point on the shore of Long Island Sound; the day was intensely cold, the thermometer hardly above zero. As the tide receded, a film of ice almost immediately covered the rocks and the fuci growing on them; every pool was covered with ice, but on breaking this coating, algae, red, brown and green, were growing in perfection, even the most delicate, filmy *Ectocarpus*. Before the pool could freeze solid, the tide would return and break the ice, and as long as they were not actually solidified, the plants experienced no inconvenience. Plants like the fuci can even endure some hours of actual congelation and being frozen so stiff that they are brittle, if the next tide releases them.

This hardness enables the algae to extend to the waters well up towards the poles, and to thrive in places where the summer temperature of the water is only about 36 degrees Fahr. Some of the *Laminariaceae* have even been known to grow luxuriantly and produce fruit, zoospores, during months when the water was never above 28 degrees Fahr.

It must not be supposed, however, that the vegetation on our

coast is the same at all seasons. Algae, as well as higher plants, include annuals, biennials and perennials. Nearly all of the latter have their periods of rest and periods of activity, but not all at the same seasons; some are quiescent during the summer and autumn, beginning a new growth in the winter, and reaching the highest point in the spring, others just the opposite. Some of the Laminariaceae produce a delicate frond at one season of the year, a coarse and leathery one at another; between the periods of activity is a period of rest, so that the two forms are sharply marked off. As the point of growth is at the base of the blade, the old frond is pushed up by the new, and the remains of a delicate frond may be seen at the tip of a coarse one, or a coarse frond with a delicate one forming at its base.

Biennials are not common among algae, and not clearly understood; the great majority of species are annuals, but these annuals, like death, have all seasons for their own. Some, like *Phyllitis*, may be found at any month of the year; some, like *Punctaria*, only in spring; perhaps the largest number of annuals appears in spring and summer, when shallow bays are warmed by the sun, and swarm with life; in southern New England, with *Dasya*, *Grinnellia*, *Agardhiella* and others of our most characteristic forms; but there are many winter annuals, both on the northern and the southern coasts. Some of them, like *Phaeosaccion*, are short lived, found for a little over a month, then disappearing utterly; in March this plant produces incredible numbers of zoospores, minute cells each with its hour or two of active, seemingly voluntary motion, then sinking to rest; what happens then, how the species continues, no one knows, but the next February the delicate fronds are there again.

The genus *Callithamnion*, taking it in the older sense, not as divided up at present, is almost a calendar of the seasons, from *Antithamnion Americanum* in February in Long Island Sound, to *Callithamnion corymbosum* in Massachusetts Bay in November, while the little *Rhodochorton Rothii*, continuously vegetating, begins to fruit in December and continues until March.

Why one species selects one season and another another, why *Antithamnion Americanum* forms its wonderfully delicate and bright colored fronds before the waters begin to warm with spring, while its not distant cousin, *Griffithsia Bornetiana*, comes only with the mid-summer days, we cannot even guess; there seems to be no generali-

zation that will cover these, and many similar cases. We can only observe, and hope that some time the facts will furnish the clue. And observing is a real pleasure, for those that have the time and the inclination. There are days in every winter month when the weather is mild, and a few hours at the shore on such days may show things never seen by summer visitors. It is hardly likely that picnic parties will be organized, to eat lunch on the rocks of Cape Ann or Marblehead, and gather "mosses"; but for one who has the opportunity, and a fairly robust constitution, winter collecting has a relish, which all who enjoy out-of-door exercise in cold weather will understand.

A NEW LOCAL FLORA. — Mr. Luman Andrews, of Southington, Connecticut, has just issued a "List of the Flowering Plants and higher Cryptogams growing upon the summit of Meriden Mountain, Connecticut." We learn from the introduction that Meriden Mountain is a trap dyke, with an altitude of 1,007 feet, being, in fact, the highest of its kind in the state. The part particularly investigated was the summit of the southern terminus, comprising about twenty acres. The list, without laying claim to completeness, contains 287 species and varieties. *Rosaceae*, *Compositae*, *Ericaceae*, *Cyperaceae*, *Gramineae*, and *Filices*, are well represented, while very few *Cruciferae*, *Caryophyllaceae* and *Leguminosae* have been found, which is by no means surprising in an exposed and rather sterile area. The list is obviously the result of much conscientious field work, in which specimens have been preserved in all cases admitting of doubt. A clear photographic print of the mountain accompanies the list.

The intensive study of the vegetation of a limited and, upon the whole, rather barren tract, although offering much that is profitable and fascinating, is not very frequent. It is to be hoped that others may follow Mr. Andrews' excellent example.

Vol. 2, No. 17, including pages 93 to 106 and plate 17, was issued May 21, 1900.



Collins, Frank S. 1900. "SEaweEDS IN WINTER." *Rhodora* 2, 130–132.

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