

A FEW REMARKS UPON MOSSES.

S. CARROLL BENNIS.

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Within reach of all, yet taken advantage of by so very few, this fascinating branch of Natural Science will be found to richly repay even the most elementary study.

Mosses flourish among the most varied surroundings and under every possible condition. An old wall or roof, a scarcely used gutter, an ancient tree trunk, a muddy ditch; each yields an abundance of specimens to the close observer, while a shady wood, a bog or stream will furnish the larger and more conspicuous varieties. I have counted at a glance, six distinct species along the stone coping of the Wellesley Bridge, and on the walls near by three or four others.

And who can aptly describe their loveliness? Even Ruskin, the greatest master of English prose, has admitted that "no words are delicate enough, none perfect enough, none rich enough to tell what these Mosses are." And when one has examined a few fresh specimens with a good lens, one can understand how, even he, found words to fail him.

Another point in their favour is this: when flowers are few during the winter months, roads too muddy and weather too wet for Archaeological expeditions, and cameras set aside until brighter weather, then the Mosses flourish, and every damp and misty day simply adds to their brilliant luxuriance. The fruit of many ripens in November and February, while all through the year some kinds may be found in perfection.

Mosses are minute, cellular plants, having distinct stems, leaves and roots (with one exception). The fruit is a capsule containing spores, from which fresh plants are developed. They may be distinguished from Liverworts by their symmetrical leaves and urn-shaped capsule, and from Marchantia, by the absence of anything like a scaly habit and the definite grouping of the leaves.

Mosses may be roughly divided into two great classes:—Acrocarpous, in which the fruit terminates the stem; and Pleurocarpous, in

which it is borne upon a lateral stem. They belong to the higher and more important branch of Flowerless Plants, and have a complicated method of fructification. When the spores have germinated, they give rise to a thread-like structure called the Prothallus, or Protomena. On this surface, which resembles a mass of velvety green threads, are developed Antheridia and Archegonia, similar to those produced by Ferns. The Antheridia are oblong, or globular bodies, and when perfected eject spermatozoids, which fertilize the Archegonia; this is flask-shaped, and subsequently develops into the Capsule or Sporangium.

The leaves of Mosses differ almost as much as those of Flowering Plants, except that they are always entire and always sessile. They may be linear, oval, obicular, the edges smooth or serrated, wavy or rolled, and the apex blunt or pointed. The nerve, which takes the place of a midrib, is sometimes prolonged into a transparent point which gives a hoary look to the tufts of some Mosses. The Capsules, also, vary considerably on different plants both as to position and form; sometimes drooping, sometimes standing erect; in some cases borne upon a long and slender stalk; in others, almost buried among the foliage. The Capsule may be urn-shaped, globose, pear-shaped, etc., constricted toward the apex, or swollen at the base. It is surmounted by a membranous hood called the veil or calyptra, which usually falls off early. The mouth of the Capsule is closed by a lid, which, when the fruit is ripe, is cast off, thus allowing the enclosed spores to escape. Around the opening, in most cases, will be found either one or two rows of teeth, called the peristome. This presents a beautiful object under the microscope, being often barred and striped, and coloured in brilliant shades of red, orange, or bright brown.

In the common Wood Moss, *Polytrichum Formosum*, the opening of the Capsule is covered by a drum-like membrane, to the edges of which the teeth are attached. The Calyptra is clothed with long, light-brown hairs, and the Capsule is distinctly quadrangular.

Tortula muralis, a Moss which grows abundantly upon walls, takes its name from the fact that the teeth of the peristome are beautifully twisted in a spiral manner. The plants grow in tufts, hoary from the hair-like points at the apex of the leaves.

Some of the most beautiful of our Mosses are the *Mniiums*, growing in damp, shady situations. The leaves are roundish, of a clear, bright

green; the cells so large that they can be easily seen with a good pocket lens. The Capsules are pendulous, glossy green, shaded with brown; there are two rows of teeth, the outer reddish-brown, beautifully barred, and the inner of a paler shade.

Looked at from a utilitarian point of view, Mosses cannot be said to be of very great importance. In Iceland, some bog-mosses are occasionally mixed with meal in order to eke out the scanty fare; in Lapland, certain species are used for bed and bedding; and the Esquimaux employ the tufts as lamp wicks. They are valuable for packing and in the cultivation of orchids. Scarcely a single species is used in medicine, nor do they afford food for the animal kingdom, although they supply a safe shelter for myriads of insects and a warm clothing for the trunks of trees. The continued growth of bog-mosses plays a considerable part in the formation of peat; and indeed, were it not for them coal could not have been formed. Thus, although in a subordinate way, they take an important part in the economy of nature. They act as the pioneers of a larger vegetation, forming the first covering for new soil, and a protective growth in which the seeds of higher organisms may safely germinate.

Enough has been said of their beauty, but should any member of this Club be sufficiently interested to take up this study, I think that they will find it richly repay any trouble which it may cost them.
