Proceedings of the Iowa Academy of Science

Volume 19 | Annual Issue Article 15

1912

Ferns and Liverworts of Grinnell and Vicinity

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FERNS AND LIVERWORTS OF GRINNELL AND VICINITY.

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The flora of the high prairie is peculiarly devoid of mosses and ferns. Excessive insolation and evaporation are prime causes of this. Though the necessary protection for mosses might be afforded by the tall grasses, the ground is too closely occupied, and moisture throughout much of the year is too scant.

Of ferns we find in the vicinity of Grinnell (including a radius of four miles):

1. Botrychium virginianum L (Sw.).
2. Osmunda claytoniana L.
3. Adiantum pedatum L.
4. Asplenium felix-foemina (L) Bernh.
5. Cystopteris fragilis (L) Bernh.
6. Onoclea sensibilis L.

Only Cystopteris can be considered a plant of the high prairie. It occurs on porus soils of the Marshall loam type, consisting of glacial drift. Here the vegetation is much less dense than on the fine grained loessial Marshall silt-loams.

In slight depressions where there is some seepage of water throughout the year (except in especially dry seasons), Onoclea occasionally appears. These places are the heads of the branches of the smaller streams. In the two localities of this kind within our range, Populus tramuloides, that pioneer tree, is found nearby. These depressions, from their size and position, are to be regarded as among our most recent topographic features.

The other four species occur only in well-wooded districts, over the line in Jasper County. They are denizens of the loose sweet humus of the forest. Osmunda, however, usually prefers a substratum of yellow clay. These species have doubtless ascended the river valleys along with the principal trees. We have therefore but one Prairie Fern.

In cultivation in Grinnell the above named Osmunda, Asplenium and Cystopteris prosper when planted on the north side of houses, close to the foundation, or on west or east sides where there is shade. Under the Aspleniums we usually find numerous prothalli in autumn, but the species does not spread successfully. Cystopteris spreads much more, even tending to wander out into grassy and more or less sunny places.

Onoclea struthiopteris was introduced last year (1911) into the Botanic Garden of Grinnell College, and is growing nicely at this time (April 25, 1912). The plants came from a private garden in Mason City, Iowa.

The liverworts are not found at all on the high prairies in this locality.* The nearest occurrence is that of Aneura pinguis on a clayey bank at Arbor Lake. This "lake" is an artificial pond in the southwest part of Grinnell City. Aneura grew at the foot of a slope facing north, where seepage water supplied constant

*Marchantia occurs occasionally in shaded lawns in Grinnell.

moisture. With it grew a few slender sedges, grasses and rushes, and nearby were species of Cladonia. It has not been seen for two years. Nearly mature sporophytes were collected in March, 1907, and 1908.

One and one-half miles west of Grinnell there is a small stream on the north side of the Rock Island Railroad tracks. The banks are three or four feet high, nearly vertical, and largely composed of naked loess. The south bank is always shaded, and quite moist. Here Marchantia polymorpha is usually found in autumn, but without gametophores. Occassionally Notothylas melanospora has been found on this same bank, beside the water's edge.

Anthoceros laevis has been collected only at the foot of moist banks on the west side of Sugar Creek, in Jasper county, three miles west of town. Here it is always found in autumn. Sometimes it is quite plentiful and covered with sporophytes.

In this same region we find on a few stumps and tree trunks a species of Frullania, probably F. virginica. It occurs in large mats. A similar Frullania was also collected on trees along Skunk River at Moore's Station, twelve miles south of Grinnell.

Ricciocarpus natans abounds in many lagoons or ox-bow ponds along Skunk River, three miles southwest of Turner Station. On an outcrop of Redrock Sandstone north of the last place there is a considerable bed of Asterella hemisphaerica. This liverwort has been found also on clayey banks of glacial drift along Skunk River in the same general region.

Thus there are within four miles of Grinnell five Hepaticae:

1. Aneura pinguis Dumort.
2. Marchantia polymorpha L.
3. Notothylas melanospora Sulliv.
4. Anthoceros laevis L.
5. Frullania virginica Lehm.

To this may be added as available to the local botanist:

1. Astrella hemisphaerica Beauv.
2. Ricciocarpus natans L.

For some reason Aneura, Notothylas and Ricciocarpus are omitted from Greene's Plants of Iowa. The last named, at least, is a well-known inhabitant of our State.