AN ECOLOGICAL SURVEY OF THE VEGETATION OF THE ILLINOIS PRAIRIES—A PRELIMINARY REPORT

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During the summer of 1915 the writer made a study of the associations of prairie plants occurring upon the relic virgin prairie tracts throughout the state. The work was conducted through the aid of the State Natural History Survey, and under the direction of Dr. Henry C. Cowles and Dr. George D. Fuller. The locations of the areas studied were obtained through ahe aid and courtesy of the county surveyors. Among the tracts visited and found to be in a sufficiently undisturbed condition to warrant further study are the flood plain and sand prairies along the Mississippi River between Ebner and Savanna and at Hanover, sand prairies in the valley of the Green River in Bureau and Henry counties, morainic sloughs near Lacon and Camp Grove in Marshall county, numerous prairies on the outskirts of Chicago on the old lake bed of Lake Chicago, and a few small areas in Jasper and Clay counties. Old fence-rows and railway rights-of-way were also considered after the survey had advanced sufficiently to indicate their limitations. A detailed account of the locations of these prairies and other less promising ones will appear in a later publication.

At the time of this report the data at hand seem sufficient to allow the formulation of the following tentative conclusions:

1. The virgin prairies of Illinois exhibit definite associations of prairie plants. These associations are related in a definite way to definite types of topography and soil conditions which range all the way from such pioneer habitats as clay, sand and swamps, to the well-drained soil of the upland prairies.

2. The development of the physiography of these pioneer habitats is followed by dynamic successions of the plant associations. The associations in these successions differ in each particular case according to the initial habitat, but in all cases they ultimately lead to a common type of climax prairie.

3. Andropogon furcatus is the most abundant grass of this climax prairie, and usually occupies more than 80 per cent of the total area of the association which it represents. This fact suggests that Andropogon furcatus is the climax grass of the Illinois prairies.

4. In their order from pioneer to climax, the most important associations of the hydrarch successions are Scirpus fluviatilis, Carex vesicaria, Spartina Michauxiana, Calamagrostis canadensis, Panicum virgatum and Andropogon furcatus. The most important associations of the xerarch succession on sand are Panicum pseudopubescens, Andropogon scoparius and Andropogon furcatus; on clay, Andropogon scoparius and Andropogon furcatus.

5. During long continued grazing the Andropogon and Panicum virgatum associations are displaced by a blue grass (Poa pratensis) sod. Each of the other associations is likewise displaced by more or less definite types of pasture plants.

6. Owing to the numerous diverse types of disturbance by man, the associations of prairie plants on railway rights-of-way are unnatural and in certain respects do not agree with those found on the undisturbed virgin areas. Relic patches of these virgin associations on these rights-of-way are, however, still abundant enough to give a general picture of the original prairies. Data collected from this point of view show that most of the prairie area of the older glaciated regions of the state had reached the Andropogon furcatus stage before the coming of the plowman, while much of the prairie area of the Wisconsin glaciation was dominated by Spartina Michauxiana, Calamagrostis canadensis and Panicum virgatum, according to the development of the drainage conditions. This conclusion is further substantiated by the word of the older inhabitants who saw these prairies in all their original grandeur.

7. In a general way the trend of the associations on the black-soil clay prairies follows the changes in the moisture content of the soil as the physiography of the regions develops. In the sand prairies transpiration, stability of the soil and probably nutrition are also factors of prime importance.

8. The data also support the theory that many of the black-soil prairies of Illinois originated from glacial lakes and swamps and have existed as prairies since glacial times.

The work is still under way and it is hoped that a detailed report will appear in 1917. The final report will be published as a Bulletin of the State Natural History Survey.