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TABLE OF CONTENTS.

| | |
|--|----|
| SCHAFFNER—The Characteristic Plants of a Typical Prairie..... | 65 |
| SCHAFFNER—The Classification of Plants, VIII..... | 70 |
| FULLMER—Additions Made to the Cedar Point Flora During the Summer of 1912..... | 78 |
| HUMPHREY—The Ohio Dogbanes..... | 79 |

THE CHARACTERISTIC PLANTS OF A TYPICAL PRAIRIE.*

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The characteristic plants of a typical prairie give to it an appearance immediately recognizable whether it is climatic or edaphic. If one had carefully prepared lists of the important plants of prairies in various part of the great Mississippi basin, it would be comparatively easy to select the plants of general distribution from those confined to special areas.

The prairie described below, not from an ecological but simply from a floristic standpoint, is situated in the center of the North American prairie province about one hundred miles east of the center of the transition zone to the plains region, in Clay County, Kansas. This region has never been glaciated and the surface rocks belong to the characteristic Dakota Sandstone.

The eastern limit of the transition zone is about forty miles to the west and may in this region be placed at the eastern limit of the range of the prairie dog (*Cynomys ludovicianus*) and the agricultural ant (*Pogonomyrmex occidentalis*), both of which are characteristic and abundant animals of the plains.

In the prairie under consideration there is, of course, some admixture of plains plants, but it is, nevertheless, a typical climatic prairie. The grasses which give color to the region are of the yellow-green type in summer and of a characteristic brown tint when dry, in winter. The color of the prevailing plains grasses is a grayish green, turning to grayish white in winter. These colors contrast sharply with the dark green of the pastures and meadows of Poas now largely developed in the eastern states.

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The typical prairie grasses are the following four species, named in the order of their importance:

Andropogon furcatus Muhl. Big Blue-stem.
Andropogon scoparius Mx. Little Blue-stem.
Sorghastrum avenaceum (Mx.) Nash. Indian-grass.
Panicum virgatum L. Tall Smooth Panic-grass.

The Big Blue-stem may be regarded as *the* prairie grass. It grows in a close sod and formerly in certain years the flowering stems would be over ten feet high. On the richer uplands it grew with such luxuriance that the location of cattle and horses could frequently not be determined except by the waving of the tall stems as they passed through it. The Indian-grass usually occurs along with the big blue-stem, while the little blue-stem is characteristic of the higher drier slopes and hills. Along with the four large grasses mentioned above are the smaller gray-green grasses:

Atheropogon curtispendus (Mx.) Fourn. Racemed Atheropogon.
Bouteloua oligostachya (Nutt.) Torr. Smooth Mesquite-grass.
Bouteloua hirsute Lag. Hairy Mesquite-grass.

In almost pure patches or mixed with the mesquite-grasses, is the very low-growing buffalo-grass, *Bulbilis dactyloides* (Nutt.) Raf., the most remarkable of the gray-green grasses of the plains. The patches of buffalo-grass are usually on the poorer clayey banks and slopes, a few yards to a number of rods in extent. The Texas spike-grass, *Schedonardus paniculatus* (Nutt.) Trel., is frequently found on the buffalo-grass patches.

In the wet ravines and level, poorly drained second-bottom lands, *Spartina cynosuroides* (L.) Willd, tall slough-grass, forms large close patches, and in "gumbo spots" subject to moisture the salt marsh-grass, *Distichlis spicata* (L.) Greene, occurs.

On the ends of spurs or ridges between ravines where coyotes, burrowing owls, badgers, and other animals delight in making their burrows and thus cultivate the ground very thoroughly, the western couch-grass, *Agropyron spicatum* (Pursh) Scribn. & Sm., is often abundant. This grass was formerly the first to grow after the prairie had been burned off in the spring and was thus usually the first available green pasture for the pioneer's cattle.

There are several sedges on the upland and various species abound in moist ravines and about ponds. Many grasses besides those mentioned above also occur on the upland and in the ravines but those named are generally the characteristic species. The Republican River flows through this region with its wide flood-plain and there are here numerous species which do not extend to the upland. Such strips or ribbons of vegetation are, however, more or less edaphic and do not belong to the general floristic picture; just as the forest belts along the streams are not essentially different, except for the small number of species, from the vegeta-

tion on the young flood-plains of a forested region like Ohio. They owe their existence to the presence of the river and not to the climatic conditions.

The prairie fire, although not the cause of the prairies, had, nevertheless, a profound effect on their vegetation. When the fires swept over the prairie in the spring, it burned up everything down to the ground, and perennial herbs and shrubs had each year to meet anew the competition above ground of the all-conquering grasses. Frequently the fires occurred in the fall and thus the soil was exposed, without covering, during the entire winter to dryness, wind and cold. Since the fires have ceased even the patches of prairie still remaining are undergoing a rapid and remarkable change in vegetation. The change in the relative abundance of certain species is no less interesting than the arrival of new forms from other regions.

After the characteristic grasses, the most prominent members of the prairie vegetation are a number of shrubs and perennial geophilous herbs. The latter are usually crownformers, often with exceedingly long taproots. When one sees such plants exposed in the banks of a stream or an arroyo, one realizes what a large part of the vegetation is underground in summer as well as in winter.

The woody or semi-woody species are few in number, though several are among the characteristic prairie plants. The most important one in the region under consideration is the shoe-string, *Amorpha canescens* Pursh, which is a low shrub a foot or two in height. Others are, *Rosa arkansana* Port., Arkansas Rose, *Meriolix serrulata* (Nutt.) Walp., Tooth-leaf Evening-primrose, and *Morongia uncinata* (Willd.) Britt., Sensitive-brier. The latter is only slightly woody. In the ravines, *Amorpha fruticosa* L., false indigo, is especially abundant on the banks of ponds. *Salix fluviatilis* Nutt., Sandbar willow, grows in small dense thickets in moist ravines and is occasionally present on banks and hillsides. In such situations, however, the shrub is always very small.

Very few seedless plants thrive on a typical prairie. There are no ferns on the prairie proper but *Woodsia obtusa* (Spreng.) Torr. grows on moist sandstone cliffs along with several species of mosses, liverworts, and lichens. *Equisetum kansanum* Schaff. occurs on clayey banks and slopes and *Marsilea vestita* H. & G. grows occasionally in buffalo-wallows in low places. The *Marsilea* seems to be near its eastern limit and is properly a plant of the plains. There are very few mosses but some small ground-loving lichens occur especially on the hills and *Nostoc commune* Vauch. is abundant on the banks of ravines. The giant puffball, *Lycoperdon giganteum* Batsch., often occurs in large numbers and in suitable seasons various other species of puffballs, toadstools and stink-horns make their appearance.

There is one prickly-pear, *Opuntia* sp., with fragrant flowers and edible fruit which ripens in late autumn. It is quite common especially in patches of buffalo-grass or in gumbo patches where it does not have to meet the competition of the *Andropogons*. On the very highest hills *Cactus missouriensis* (Sweet.) Ktz., the Missouri cactus, grows although it is quite rare.

Besides the grasses, the most characteristic plants of the prairie, as stated above are perennial geophytes, mostly crown-formers with deep taproots. Of special prominence are *Psoralea floribunda* Nutt., many-flowered *Psoralea*, and *Psoralea argophylla* Pursh, silver-leaf *Psoralea*. Both species are tumbleweeds, being separated from the perennial base by means of cleavage planes developed in the stems near the ground. *Psoralea esculenta* Pursh, prairie-apple, with its thickened root is also common. In the spring and early summer, three species of wild-indigo are found here and there as conspicuous members of the flora, namely, *Baptisia australis* (L.) R. Br., *Baptisia bracteata* Ell., and *Baptisia leucantha* T. & G. having blue, cream-colored, and white flowers respectively.

Other large and conspicuous species are as follows:

- Verbena stricta* Vent. Hoary Vervain.
- Verbena hastata* L. Blue Vervain.
- Vernonia baldwini* Torr. Baldwin's Ironweed.
- Euphorbia marginata* Pursh. Snow-on-the-mountain.
- Carduus undulatus* Nutt. Wavy-leaf Thistle.
- Artemisia gnaphalodes* Nutt. Prairie Mugwort.
- Artemisia ludoviciana* Nutt. Lobed Mugwort.
- Glycyrrhiza lepidota* Pursh. Wild Liquorice.
- Helianthus maximiliani* Schrad. Maximilian's Sunflower.
- Helianthus subrhomboides* Rydb. Rhombic-leaf Sunflower.
- Heliopsis scabra* Dun. Rough Oxeye.
- Lespedeza capitata* Mx. Round-headed Bush-clover.
- Allionia linearis* Pursh. Narrow-leaf Umbrella-wort.
- Ambrosia psilostachya* DC. Western Ragweed.
- Acuan illinoensis* (Mx.) Ktz. Illinois Acuan.
- Salvia pitcheri* Torr. Pitcher's Sage.
- Meibomia*—several species.
- Lactuca*—several species.
- Hieracium longipilum* Torr. Long-bearded Hawkweed.
- Nabalus asper* (Mx.) T. & G. Rough Rattlesnake-root.
- Onagra biennis* (L.) Scop. Common Evening-primrose.
- Gaura parviflora* Dougl. Small-flowered Gaura.
- Gaura biennis* L. Biennial Gaura.
- Onosmodium carolinianum* (Lam.) DC. Slaggy False-gromwell.
- Grindelia squarrosa* (Pursh) Dun. Broadleaf Gum-plant.
- Cuscuta paradoxa* Raf. Glomerata Dodder, a conspicuous parasite mostly on the tall herbs of the sunflower family, growing in ravines but occasionally on the upland.

Among the smaller plants usually common may be mentioned:

Juncus tenuis Willd. Slender Rush.
 Panicum—several small species.
Antennaria campestris Rydb. Prairie Everlasting.
Plantago purshii R. & S. Pursh's Plantain.
Achillea lanulosa Nutt. Western Milfoil.
 Astragalus—several species.
Oxalis violacea L. Violet Wood-sorrel.
Linum sulcatum Ridd. Grooved Yellow Flax.
Kuhnia glutinosa Ell. Prairie Kuhnia.
Erigeron ramosus (Walt.) B. S. P. Daisy Fleabane.
Mesadenia tuberosa (Nutt.) Britt. Tuberosus Indian-plantain.
Kuhnistera purpurea (Vent.) MacM. Violet Prairie-clover.
Kuhnistera candida (Willd.) Ktz. White Prairie-clover.
Physalis virginiana Mill. Virginia Groundcherry.
Asclepiodora viridis (Walt.) Gr. Oblong-leaf Milkweed.

Among the early spring flowers that grow on the upland, and not mentioned above, the following are notable:

Anemone caroliniana Walt. Daisy Anemony.
Anemone decapetala Ard.— This is not distinct from the preceding.
 There are a number of elementary species. The colors are white blue and reddish pink, the blues being of many shades.
Nothocalais cuspidata (Pursh) Greene. Wild-dandelion.
Viola pedatifida Don. Prairie Violet.
Sisyrinchium campestre Bickn. Prairie Blue-eyed-grass.
Lithospermum linearifolium Goldie. Narrow-leaf Puccoon.
Callirrhoe alceoides (Mx.) Gr. Light Poppy-mallow.
Callirrhoe involucrata (T. & G.) Gr. Purple Poppy-mallow—mostly in ravines and bottoms.
Vicia linearis (Nutt.) Greene. Narrow-leaf American Vetch.
Tradescantia, sp.

The above would represent the usual plants in a prairie bouquet gathered in the spring, although a few additions might be made to it from the ravines.

The summer and autumn flowers include among others the following:

Solidago—several species, the most beautiful being the early-blooming *S. missouriensis* Nutt., Missouri Goldenrod.
 Aster—several species including the beautiful silky aster, *A. sericeus* Vent.
Ruellia ciliosa Pursh. Hairy Ruellia.
Ratibida columnaris (Sims) D. Don., Long-headed Prairie-cone-flower.
Laciniaria punctata (Hook.) Ktz. Dotted Blazing-star.
Gyrostachys, two species.
Gerardia tenuifolia Vahl. Slender Gerardia.
Gentiana—a beautiful undetermined species with deep blue flowers.

This prairie is changing rapidly through the influences brought in by the settlement of the country and because of extensive cultivation and pasturing. Even now it would be difficult for one who has never seen the original, endless sweep of green vegetation as it extended over hill and plain, before the advent of the early settlers who came in great numbers in 1869-71, to form a clear conception of the prairie's former grandeur or to realize the important floristic changes that have already taken place and that are still in progress.