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THE FLORA OF THE PRAIRIES.

BY J. A. ALLEN.



PROBABLY the vegetation of no two adjoining regions, both of which are situated between the same parallels of latitude and at nearly the same height above the sea, presents greater differences than exist between the vegetation of the fertile prairies of the Mississippi Valley and the forest region that extends from their eastern border to the Atlantic coast. To one who has always lived amid the diversified scenery of the Eastern or Middle States, where distant mountains almost everywhere bound the view, and forest-crowned hills and cultivated valleys so agreeably alternate as to dispel the possibility of monotony, a first view of the primitive prairies, —

“The unshorn fields, boundless and beautiful,”

as Bryant has so felicitously described them, which

“stretch
In airy undulations far away
As if the ocean, in his gentlest swell,
Stood still, with all his rounded billows fixed
And motionless forever.” —

is extremely novel and full of interest. But the prairies, “unshorn” of their primitive wildness will soon be things of the past, so great are the attractions they hold forth to the emigrant, and so rapid the transformation that follows their

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settlement. Already there are few localities east of the Missouri where their primal simplicity and beauty have not already been more or less modified.

Great changes in the vegetation of a new country necessarily result from its settlement by an agricultural people, but the rapidity and ultimate completeness of the transformation greatly depend upon the relative susceptibility of the country to cultivation. Since vast areas of the prairies offer no obstructions to the revolutionizing plow, the astonishing rapidity of the change in the flora that follows its march can scarcely be conceived by those who have not witnessed its actual progress. No sooner is the sod inverted than scores of species of the original and most characteristic plants almost wholly disappear; in a few years the luxuriant wild grasses, overtopped with showy flowers, varying the hue of the landscape with the advancing season, have become supplanted by the cultivated grasses and the cereals, and that constant scourge of the agriculturist, the ever intrusive weeds. The timber no longer remains confined to narrow belts skirting the streams, for besides the newly-set orchards, rapidly growing kinds of trees, planted to afford shelter from the fierceness of the summer's sun and the fury of the bleak winter winds, everywhere diversify the landscape, while comfortable log cabins, or neatly painted, commodious houses give an air of civilization to districts that at no distant period were the undisturbed home of the buffalo and the elk.

Far more slow has been the change at the eastward, where the forests have slowly yielded to the axe of the woodman, and where much of the land is too uneven for cultivation. Here the forests, though in the longest settled districts perhaps once or twice removed, still cover no inconsiderable part of the country, and consist, for the most part, of the indigenous trees in nearly their original proportions, while the lesser shrubs and the herbaceous plants they primitively sheltered are still persistent, and to a great de-

gree occupy the neglected pastures, the roadsides and the waste nooks of the farms. In short the transformations of the flora of the prairies are often far more complete after a period of settlement covering but two decades, than are to be seen in those portions of New England which have been occupied by Europeans for as many centuries.

In the present article it is proposed to sketch briefly some of the peculiarities of the primitive flora of the Upper Mississippi prairies,* which not improperly, either in respect to their fertility under cultivation, or the luxuriance and beauty of their native vegetation, have been styled the "Garden of the West." The wild plants of the prairies present at every season features peculiarly attractive. In spring anemones and violets, as elsewhere, are among the early flowers, the latter of which are particularly numerous and characteristic, peering brightly out among the young fresh blades of grass. To these soon succeed several species of beautiful phloxes, the painted cup, and the prairie rose. Later still appear the purple and the white turban flowers (*Petalostemon violaceus* Michx., and *P. candidus* Michx.), the ceanothus, the hoary-leaved, purple-flowered lead plant (*Amorpha canescens* Nutt.), the purple cone flower (*Echinacea angustifolia* DC.), and, from its abundance perhaps the most conspicuous of all, the beautiful *Coreopsis palmata*, which here and there gives its own bright color to large patches of the undulating landscape. Blazing stars of several species (*Liatris squarrosa* Willd., *L. pycnostachya* Michx., *L. scariosa* Willd.), with their long nodding spikes of rose-purple flowers soon follow, ranking among the most showy of the many showy plants. To these are soon added sunflowers of various species, most common of which are the *Helianthus rigidus* Desf., the *H. giganteus* Linn., the *H. grosse-serratus* Mart., the *Actinomeris helianthoides* Nutt., and the *Lepachys pinnata* T. & G.; the tall compass plant (*Silphium lacini-*

*The region more especially under consideration is Northern Illinois, and Central and Western Iowa.

atum Linn.) ; the Indian plantain (*Cacalia tuberosa* Nutt.), the tall verbena (*V. hastata* Linn.), and the yucca-leaved rattlesnake master (*Eryngium yuccæfolium* Michx.) ; all generally remarkable either for their large showy flowers, or the peculiar character of their foliage or habits. Finally the season closes with the later sunflowers and coreopses, some of which are of gigantic size, towering far above one's head ; the purple-flowered gaurias and the golden epilobiums. From the first springing up of the early flowers till the frosts of autumn end the floral season, the prairies are arrayed in bright and showy hues by a succession of species of larger and taller growth, each later set not only overtopping their predecessors, but the rapidly growing prairie grasses. Ever varied too are the prevailing colors. Here blue prevails, there white or purple, and again large tracks are golden, as everywhere a few prevailing forms give character to the vegetation. Generally they are coarse, large plants, often resinous, with thick, harsh leaves and large flowers, and nearly all are species never or rarely met with in the Atlantic States, and never as characteristic species of the eastern flora. The *Compositæ* and the *Leguminosæ* are preëminently the prevailing families, far more so indeed than at the eastward.

Many of the species are in various ways remarkable, but none more so perhaps than the plant popularly known as the compass plant (*Silphium laciniatum*), whose large, thick, rigid, upright root-leaves, one to two and a half feet long, are reputed to uniformly present their edges north and south, whence its name. Though they do not thus *invariably* arrange themselves, they *generally* stand in this direction, so uniformly in fact that they well serve as a convenient guide to the traveller in determining the points of the compass.* Another species of the same genus, called the cup

* Since the above was written an interesting paper on the Compass Plant was read by Dr. Thomas Hill at the Troy meeting of the American Association for the Advancement of Science, an abstract of which has just appeared in the *NATURALIST* (Vol. iv, p. 495, October, 1870). Dr. Hill refers this polarity to the sunlight, the two sides of the leaf being equally sensitive, and struggling for equal shares.

plant (*S. perfoliatum*), from the large opposite leaves of the stem being connate at their bases, forming a considerable cup-like cavity, capable of containing water, is common in the moist ravines. Other remarkable forms are the Indian plantain (*Cacalia tuberosa*), conspicuous for its thick, smooth, plantain-like leaves, deep-green on both sides and strongly ribbed; and the yucca-leaved rattlesnake master, or button snakeroot (*Eryngium yuccæfolium*), with its linear grass-like, bristly fringed leaves, and its bracted flowers, closely sessile in dense heads,—an umbelliferous plant, but wholly unlike the generality of the species of the *Umbelliferae*, both in its foliage and in the form of its inflorescence. The prairie clovers, or turban flowers (*Pentalostemon*), are among the most interesting of the leguminose species, and among the most characteristic. Their oblong or cylindrical heads of white or purple flowers are evidently suggestive of the latter name. Each head continues in flower for many days. At first the flowers form a band at the base of the head, which, gradually moving upward, later occupies the middle of the head, and finally its summit, recalling the Oriental head-dress, in allusion to which these plants have received one of their common names.

The habits of some of the sunflowers, but especially those of the *Helianthus rigidus*, present one feature of interest. The *H. rigidus* is one of the earliest flowering species and one of the most abundant ones, it being in some localities one of the most conspicuous and characteristic plants. By the middle of August it has attained nearly its full height, which commonly ranges from two and a half to four feet; the terminal heads of the earlier specimens have already begun to unfold their yellow rays, and those of the rest are nodding on their flexible stalks. It is a popular belief that the sunflower always turns its flowers towards the sun, but in reality so numerous are the exceptions to this rule in our garden sunflowers and in our common wild species of the East, that few observing people regard it doubtless as other-

wise than an idle whim. With many of the prairie sunflowers, however, the facts are different; especially is this so in the case of *H. rigidus*. Morning after morning, at flowering time, the heads of this species may be seen bending gently towards the east; they are erect at mid-day, and at evening gracefully droop towards the west. This continues day after day for weeks, with surprising regularity and uniformity. Later, however, the stems grow rigid and remain nearly vertical. In this case at least the popular notion referred to above seems well founded.

Aside from the open prairie species already mentioned—which embrace the greater part of the most conspicuous ones—numerous others of almost equal interest are found growing in the low grounds, and in the open forest belts that skirt the streams. Prominent among these are coreopses and sunflowers of several species, especially the *C. aristosa* and *C. tripteris*, *Helianthus strumosus*, *H. decapetalus* and *H. trachelifolius*; the ground nut (*Apios tuberosa* Mœnch.) with its fragrant, dark purple flowers; the western iron weed (*Vernonia fasciculata* Michx.), the great St. John's-wort (*Hypericum pyramidatum* Ait.), the broad-leaved polygonum (*P. Pensylvanicum* Linn.), and, in more open and drier places, the rag-weeds (*Ambrosia*), the wormwoods (*Artemisia*), the tick-trefoils (*Desmodium*), the bush clovers (*Lespedeza*), and the psoraleas. Many species of such eastern plants as love rich moist woods, are also found here.

One of the strangest features, perhaps, in the flora of the prairies, and that which of course constitutes them prairies, is the entire absence of arboreal or even suffruticose species, the timber of this region, as is well known, forming open park-like belts along the streams, which with great propriety have received the name of "groves." Here the species, as might be expected, more strongly recall the flora of the East, the resemblance extending not only to the trees and shrubs, but to the herbaceous species that flourish beneath their shelter. But the predominant species can hardly be regarded

as properly eastern forms, while the entire absence of representatives of some large groups of trees and shrubs that are common at the East makes the difference greater than at first seems. One may traverse hundreds of square miles in the prairie districts without meeting a single birch, alder, a chestnut, beech, or aspen (*Populus tremuloides* Michx.), nor any species of pine, spruce, hemlock or other coniferous tree, all of which are so abundant in the forests of the Atlantic States as to constitute the prevailing species. Two species of cottonwood (*Populus monilifera* Ait., and *P. angulata* Ait.), so closely allied as to be confounded as one by the casual observer, but neither of them exclusively western, are probably the most characteristic trees, as they are certainly the most abundant and important. The sugar maple, the linden, elms, bitter-nut and other hickories (chiefly the former), butternuts, black walnuts, burr, white, black and other oaks, several species of ashes, the beautiful ash-leaved maple (*Negundo aceroides* Mœnch.) and the locust (*Robinia Pseudacacia* Linn.), are the principal and almost the only important kinds of timber, the greater number of which are more or less common trees. Among the shrubs are several species of sumach (*Rhus*) and the hazel bush (*Corylus Americana* Walt.), which here, as at the East, principally compose the thickets, whilst the *Ceanothus*, or Jersey tea, is a frequent inhabitant of the prairies. One searches in vain, however, for any whortle-berry bushes (*Vaccinium*), of which so many species abound at the East, or for any representatives of the large family *Ericaceæ*, than which no family is more characteristic of the woodlands of the Eastern States. Viburnums are common, and the elder (*Sambucus Canadensis* Linn.), the honeysuckle (*Lonicera*), the snow-berry (*Symphoricarpos*), and other caprifoliaceous shrubs are more or less frequent. The wild apple, the Washington thorn (*Cratægus cordata* Ait.), and the wild plum are common among the rosaceous shrubs, but blackberries and raspberries are rare. The wild plum grows in the river

bottoms in unsurpassed perfection. Though they are all, or nearly all, of the same species (*Prunus Americana* Marsh), the varieties in respect to the form, size, color and quality of the fruit are almost endless, the plums varying in form from spherical to egg-shaped, and from nearly white through every intermediate stage of color to yellow and even dark red, and in flavor from bitter, uneatable kinds to those as delicious as the highly cultivated varieties of the garden.

From the abundance of woody climbers the forests of the river bottoms sometimes present an almost tropical aspect. The Virginia creeper (*Ampelopsis quinquefolia* Michx.), and the winter grape (*Vitis cordifolia* Michx.), climb to the tops of the highest trees, with a diameter of the stem exceeding any specimens I have elsewhere seen. Other climbers are frequent, including the singular wild cucumber, or balsam apple (*Echinocystis lobata* T. & G.), which assumes an almost tropical luxuriance, here and there abundantly enveloping the trees.

The restriction of the forests to the river bottoms and their banks has previously been alluded to as a remarkable feature, of which various explanations have been offered. The fact of the rapid encroachment of the forests upon the prairies wherever they have been protected from exposure to the annual fires that formerly swept over the country, and the rapid growth of the timber whenever it becomes established, indicate clearly that not only have the fires had much to do with their restriction, but that there is nothing either in the climate or the soil unfavorable to their rapid spread. The damper northern slopes of the streams being also generally better wooded than the necessarily drier southern slopes, also points to the fires as the great agency that has operated through long ages to check their increase, and that their circumscription has had little to do with the peculiar origin of the prairies and of their present flora, as some have formerly supposed.

As has been already incidentally remarked, the vegetation

of the open prairies, as compared with the herbaceous vegetation of regions to the eastward similarly situated geographically, is mostly made up of coarse, large species, and of forms peculiar to the prairies. It consists, moreover, principally of a comparatively few predominant forms,—features strongly in contrast with those of the neighboring regions. The grasses, like the exogenous species, are also few in species, but coarse and luxuriant, as they are the product of a soil of unsurpassed fertility. Yet the flora as a whole is one singularly susceptible to the inroads of civilization. Even the grazing of cattle for a few years is sufficient to materially alter its character. The grasses, according to the testimony of early settlers, soon dwindle in size and luxuriance, while the relative abundance of the other plants becomes materially altered. As already remarked, the breaking and turning of the soil at once exterminates a large number of the previously dominant species, and instead of lingering as troublesome weeds, the more hardy exotics, that through man's influence assume an almost cosmopolitan habitat, usurp their places, the cereals, the cultivated grasses and the noxious weeds of the old world thoroughly crowding out the original occupants of the soil. With all the beauty and the novelty of the primal flora of the prairies, the traveller, after a few weeks of constant wandering amid their wilds, is apt soon to experience a monotony that becomes wearisome, the full degree of which he scarcely realizes till the soft green sward and the varied vegetation of cultivated districts again meet his eye.