

The following transcription is an unpublished report written by Charles Geyer. It appears to have been intended as an appendix to J.N. Nicollet's map entitled "Hydrographical Basin of the Upper Mississippi River" published 1842-1843.

The report summarizes the botanical observations of Geyer as he travelled with the Nicollet Expedition through what is now southern Minnesota, NW Iowa and the eastern Dakota's. The report is certainly based on his botanical field notebooks. The 1838 notebook survives to this day, the 1839 notebook is missing.

In transcribing the report (the original will be posted on the web in early 2013), we have tried to remaining faithful to the original formatting. This includes the page breaks, words that repeat at the beginning and end of subsequent pages, two columns, typographical and spelling errors.

The scientific names are what Geyer listed at the time and many of changed in the intervening 160 years. For example, *Donia squarrosa* Pursh is now known as *Grindelia squarrosa* (Pursh) Donal. We are working on a synonymized list for the prairie species. Many of the modern names can be found by looking for the herbarium specimens collected by Geyer (<http://www.stolaf.edu/academics/nicollet/geyerspecimensintro.html>), or doing a name search at the Missouri Botanical Gardens website Tropicos. A separate list of plants (date/author unknown) is also available along with this transcript).

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Report of an agricultural botanical survey, as an addition to a general report of a geographical survey of the country between the Mississippi and the Missouri rivers. Accomplished in the years 1838 and 39 under the guidance of J.N. Nicollet

Every practical agriculturist joins in the opinion that the quality of the soil in the wilderness may be determined to a satisfactory degree by the different trees shrubs or herbs growing on the same; and further by the knowledge of their state of perfectness and their extent, one may be enabled to form a true idea of the degree of fertility and value of distant unknown regions.\*

The vegetation of the Mississippi valley near St. Louis, when compared with that of its adjoining uplands, gives about the same difference as the latter if compared with the vegetation of those remote prairie regions; which are less intersected by wooded rivers

\*Plants are the most certain indicators of the nature of a soil: for while no practical cultivator would engage with land of which he knew only the results of a chemical analysis, or examined by the sight and touch of a few bushels which were brought to him, yet every gardener or farmer who knew the sorts of plants it produced would be at once able to decide as to its value for cultivation. — **Brownes' Arboriculture.**

But as many of the plants of the prairie regions and the upper Missouri are not common to other parts of the United States, it is necessary to mark out the predominating varieties of soils with their localities and a few of their plants.

Sandy Soils

Sand free limy mouldy- drift sand plains upper Mississippi and new Devils' lake — Hudsonia tomentosa Nutt. Petalostemon villosum Nutt. Salsola depressa Pursh.

Sandy clayey Saline- localities in the prairies between James and Red river—Arenaria rubra Michaux. Salicornia herbacea.

Sandy clayey mouldy Saline- localities between James and Red river- Glauca maritime L. Triglochin maritimum.

Sandy loamy saline (mouldy)- localities in the Missouri valley above L'eau qui court river, — Sesleria dartyloides Nutt.

Sandy argillaceous clayey Salinev - Grassy hill sides of the Missouri hills above L'eau qui court river. Stanleya pinnatifida Nutt. Pentstemon erianthera Nutt.

Sandy argillaceous Sulphuric mouldy- Missouri hills above L'eau qui court river Yucca angustifolia Pursh. Oenothera caespitosa Pursh. Torreya ornata Nutt.

Sandy granitic limy loamy- highest

rivers and creeks and would not admit that comparison, did not a large number of well distributed lakes surrounded with fine woods and fertile meadows balance that defect; and large sections of prairie are often superior in fertility to the rich upland prairies of Illinois, while others adjoining them are less fertile or of a somewhat sterile and arid character; to which we shall return towards the end, beginning with a general and somewhat detailed view over the vegetation and its variations, at the most fertile and southern point of our journey; from St. Louis up the Missouri and Mississippi rivers throughout the whole intermediate surveyed regions.

The high degree of fertility and the vigour of the woods in the Missouri and Mississippi valleys, and even on the uplands, is reduced considerably near the mouth of Platte river on the Missouri and at or near the head of the upper rapids on the Mississippi river.

ridges of the high prairies throughout-- *Artemisia frigida* Pursh.

Sandy granitic loamy ferruginous. -- ridges of the high prairies near the Missouri hills above L'eau qui court river. -- *Astragalus hypoglottis*.

Sandy granitic limy loamy mouldy- lower hills of the high prairie. -- *Astragalus Laxmanni*. *Rudbeckia purpurea*. *Pentstemon albidum* Nuttall.

Sandy (fine) mouldy clayey ferruginous.- level prairies between James river and Missouri river. -- *Rudbeckia columnaris* Pursh *Diplopappus pinnatifidus* Hooker. *Chrysopsis villosa* Nuttall. *Artemisia frigida* Pursh.

Sandy loamy mouldy common elevated prairie throughout. -- *Aster hyssopifolius* Willd. *Astragalus carnosus* Nutt. *Pedicularis canadensis*.

#### Clayey soils

Clayey loamy, sandy-(granitic), limy, mouldy. Level elevated prairie between James and Red river. -- *Eleagnus argentea* Nuttall. *Sisyrinchium mucronatum* Michx. *Campanula rotundifolia* W. *Castilleja occidentalis* Torr. & James. *Erigeron glabellum* Nutt.

Clayey loamy ferruginous Sandy. -- Valley of the Missouri above L'eau qui court river\_ *Triticum missouricum* Sprengel. *Uniola spicata*. *Festuca tenella* Pursh.

Clayey Sandy (course and fine) mouldy- low prairies throught. *Helianthus angustifolius* Willd. *Tradescantia virginica* L. *Anemone virginica*. *Leptandra virginica* Nutt. *Neottia cernua* Willd.

Clayey Sandy (course and fine mouldy wet); -- *Limnethis cynosuroides* Willd. *Scirpus macrostachyus* Michx. *Helenium automale*. *Gentiana Saponaria*. *Boltonia asteroides*. L'Herit.

Within these limits have gradually disappeared some of the most prominent trees of the forests,\* as the Sycamore, Pecan-nut, Shellbark, and Pignut hikory, white walnut, thick Shellbark hikory, pin and overcup oak, the sweet locust and others, with many smaller trees, shrubs and herbs, as the large buckeye, persimmon, sassafras, trumpet-flower, ginseng, may-apple and others; so, that above those given limits the woods may be considered half reduced in the number of species of their trees, shrubs and herbs.

The common elevation of the Missouri valley up to the mouth of the Platte river is higher ~~and more extensive~~ than that of the Mississippi to the given limit, and the variety in the vegetation greater, the forests far more vigourous, so that the trees of the upland woods of the Missouri are yet the size of the valley forest trees of the Mississippi with only few local exceptions.

From the mouth of Platte river the Missouri valley is lower and frequently inundated, the

\* *Platanus occidentalis* L. *Carya olivaeformis* Willd.  
*Carya sulcata* Nuttall. *Carya porcina* Nutt. *Carya alba* Nutt. *Quercus palustris* Michx. *Quercus alba* L.  
*Quercus lyrata* Walter. *Gymnocladus canadensis* Lam.  
*Gleditschia triacanthos* L. *Ostrya virginica* Aiton.  
*Aesculus pallida.* *Diospyros virginiana.* *Laurus*  
*Sassafras.* *Borya acuminata* Michx. *Bignonia radicans*  
L. *Panax quinquefolium* Lin. *Podophyllum peltatum*  
L. *Diclytra cucularia* De Land. *Dentaria laciniata*  
Muhlbg.

forests are narrower, their principal trees\* the American and red elm with the soft maple, Canadian poplar, ashleaved maple, white and red ash, their common under growth are hose- briars, fox and false grapes, red rod, gray dogwood, currants and gooseberry shrubs and dense rusdes\*\* along the banks of the river. The same trees and shrubs grow on the numerous islands which are generally bordered with the black and long leaved willows. In the higher situations and in the more elevated creek valleys,\*\*\* the black walnut, red mulberry, basswood, nettle tree are intermixed with the former, with the common hawthorn, prickly ash, alice, red rod and gray dogwood and others for undergrowth. On the high grassy or rocky banks are the black\*\*\*\* and bur oak the principal trees; wild cherry, red cedar, hornbeam and the buffaloe-berry or buckthorn are trees of a divar fish growth with great variety of color in their foliage; medlar, rose and summach shrubs grow scattered

\**Ulmus americana* Michaux. *Ulmus fuhva* Michx. *Populus laevigata* Willd. *Acer eriocarpum* Mchx. *Negundo fraxinifolium* Nutt. *Fraxinus acuminata* Link. *Fraxinus pubescens* Walter. *Smilax rotundifolia* L. *Ampelopsis quirquefolia* Mchx. *Vitis viulpina* L. *Cornus sericea* W. *Cornus circinnata* l'Heritier. *Ribes floridum* Willd. *Ribes trflorum* L. and

\*\**Equisetum hymade* L.

\*\*\**Juglans nigra* L. *Morus rubra* L. *Celtis occidentalis* Willd. *Tilia americana* Willd. *Crataegus coccinea* L. *Xanthoxylon fraxineum* Willd. *Viburnum lentago* L.

\*\*\*\**Quercus tinctoria* Bartram. *Quercus macrocarpa* Michaux. *Juniperus virginiana* Wanghm. *Prunus rubra* Aiton. *Shepherdia argentea* Nutt. *Carpinus americana* Willd. *Aronia ovalis* Persoon. *Rosa parviflora* Willd. *Rhus aromatica* Aiton. *Ribes aureum* Pursh.

The *Shepherdia argentea* Nutt. or *Hippophae argentea* Pursh. is the same tree which is mentioned in the narrative of Lewis and Clarke as 'rabbit berry' generally called 'grain des boeufs' by the Canadian and 'buffaloe berry' by the American travelers. A small tree seldom above 15 feet in height and 6 inches diameter of its trunk, with somewhat irregular branches and spinescent branchlets, around which the berries are collected in small clusters, the leaves are ablong ovate obtuse and covered with stellate silvery scales; the berries are also scaly and when ripe it is said they are diaphanous and of a sharp sour taste, more agreeable after the frost has affected them. It grows luxuriant on a sandy loamy soil along the banks of the Missouri, and makes its first appearance near the mouth of the Platte river; it is also abundant along the banks of the upper Big Sioux river and in the ravines near Big Stone lake upper St. Peter river on the coteau des Prairie. The tree resembled in habitat and color of foliage the *Hippophae rhamnoides* of northern Europe.

among them. The uplands are sparingly wooded with a few scattered bur oaks<sup>\*</sup>, their shrubs are generally the hazel, red root, and virginian goats rue. The lower prairies often adjoining the river are of a deep fertile soil and abound with rich sedge grasses<sup>\*\*</sup> and leguminous plants; the same fresh green is spread also over their variously crested ranges of high earthen hills<sup>\*\*\*</sup> adding a pleasant feature to the wild scenery, very contrasting with the extensive naked sandbars of the river.

These pretty openings continue changing from one side of the river to the other with the same degree of fertility and little change in the vegetation, as long as the carboniferous sand-stone formation continues, near the termination of which, it is at once checked to a much lower grade; the forests become narrower, the valley less extensive, the whole country assumes a new character and a different vegetation more decidedly near the mouth of l'eau qui court river at the

\**Quercus macrocarpa* Mchx. *Corylus americana* Walter. *Ceanothus americanus.* *Tephrosia virginiana* Persoon.

\*\**Carex lagopodioides* Schkuhr. *Carex scabrata* Schwein. *Larea Straminea* Willd. with 4 or 5 others. *Lathyrus polymorphus* Nuttall. *Lysimachia capitata* Pursh. *Viola palmata* L. *Viola cuculata* Willd. *Sisyrinchium mucronatum* Mchx.

\*\*\*These hills are of a loamy sandy, limy soil, they resemble the grassy hills along the American bottom opposite St.Louis, and differ but little in their herbage; though as the former are apparently, alluvial, they are more fertile. -- The black snake hills a short distance above the mouth of Kansas river are of the same appearance, and unlike the others their slopes dressed with hazel and chinquepin oak. -- The herbs are the *Batschia canescend.* *Bactshia longiflora* Nuttall. *Troximon cuspidatum* Pursh. *Astragalus carnosus* Nutt. *Cypripedium candidum* and others. -- In the high alluvial prairies is the *Anemone tenella* Pursh and *Ferula foeniculacea* Nutt. abundant.

The beginning of the argillaceous bituminous slate formation.

The whole country of the upper Mississippi has throughout a moderate and more proportional distribution of woodland even through the metalliferous limestone region. From above the head of the upper rapids the woods of the valley and islands correspond in variety with those on the Missouri above the Platte river, (with the exception of the red birch which is not on the Missouri, and frequently abundant on the low islands of the Mississippi) but they retain a superiority in extent and size of their trees. The declivities of the carboniferous lime and sandstone hills, some of them of the heights of 400 feet above the level of the river, are dressed with small trees\* of red cedar, red birch, red, black and scarlet oak, with groups of tall white pines, projecting from the protected intervals of the rocks giving to the whole a very picturesque and solid appearance; while the low valley is

\* Juniperus virginiana. Quercus coccinea Wm. Quercus rubra. Quercus tinctoria Bartram. Pinus variabilis Lambert. Pinus strobus. Betula rubra Michx. Chimaphila corymbosa Pursh. Goodyera pubescens Willd. Hieracium gronovii. Asplenium rhizophyllum Willd. Pteris atropurpurea Willd. Polypodium virginianum Willd. Pyrola rotundifolia L. Vaccinium pennsylvanicum Michx.

ley is torn and cut by numberless channels in large and small islands filled with luxuriant and graceful trees, fringed with millions completing that grandeur of scenery for which the upper Mississippi is known.

In the elevated river and creek valleys the black walnut\* basswood prickly ash, white beads false cohosh with other trees shrubs and herbs indicate a fertile soil as well as black and bur oak, red root and hazel scrubs on the uplands.

In different localities level sandy plains\*\* of some extent join the river valley with the uplands; partly overlaid by a loamy sandy soil, and partly open, so that the wind drives the sand continually from one end to the other giving a barren appearance to the land; as it is the case at the left bank of lake Pepin and near the mouth of Embarras river; at the latter place the banks of the Mississippi are fringed with yellow pine, red cedar, red

Common trees, shrubs and herbs of the low and elevated woods-

\**Juglans nigra* L. *Tilia Americana* W. *Celtis occidentalis* Willd. *Ulnus americana* Michx. *Ulnus fulva* Michx. *Acer eriocarpum* Michx. *Negundo fraxinifolium* Nuttall. *Fraxinus acuminata* Link. *Fraxinus pubescens* Walter. *Carpinus americana* Willd. *Populus canadensis* Michx. *Populus grandidentata* Michx. *Betula rubra* Michx. *Quercus macrocarpa* Michx. *Quercus tinctoria* Bart. *Xanthoxylon fraxineum* Willd. *Crataegus coccinea* Linnee. *Crataegus pyrifolia* Aiton. *Prunus rubra* Aiton. *Viburnum Lentazo* L. *Staphylea trifoliata* L. *Aronia ovalis* Persoon. *Sambucus canadensis* L. *Cornus alba* Willd. *Cornus circinata* L'Héritier. *Cornus sanguinea* Lin. *Ribes flordium* Willd. *Ribes triflorum* Willd. *Euonymus atropurpureus* Jussieu. *Vitis vulpina* L. *Ampelopsis quinquefolia* Michx. *Smilax rotundifolia* L. *Menispermum canadense* Lin. *Aralia hispida* Michx. *Aralia nudicaulis* Willd. *Caulophyllum thalictroides* Mchx. *Hydrophyllum appendiculatum* Mchx. *Geranium maculatum* L. *Arum triphyllum* Willd. *Convallaria multiflora* L. *Convallaria stellata* L. *Convallaria bifolia* L. *Asarum canadense* L. *Mitella diphylla* Willd. *Uvularia perfoliata*. *Viola pubescens* Aiton. *Urospermum Claytoni* Nutt. *Smilax herbacea*. *Phlox divaricata*. *Claytonia virginica* L. *Erythronium dens canis* Willd. *Diclytra cucullaria* De Cand. *Trillium pendulum* Willd. *Urtica pumila* L. *Cypripedium parviflorum* Salisbury. *Orchis spectabilis* Willd. *Mariscus echinatus* Elliott. *Equisetum hymale* L. *Equisetum sylvaticum* L. *Adiantum pedatum* L. *Struthiopteris germanica* W. *Osmunda interrupta* Michx. *Osmunda spectabilis* Willd.

\*\*These drift sand plains are remarkable for their peculiar plants;-- near Embarras river grows the *Petalostemon villosus* Nuttall. *Andropogon scoparius* Michx. *Poa pectinacea* Mich. with the *Hudsonia tomentosa* Nutt. *Polygonum articulatum* L. and large tracts of *Geastrum hygrometricum*;-- at Traverse des Sioux, St.Peter river the first two of the former and the *Stipa juncea* L. *Cyperus dentatus* Torrey. *Orobanche fasciculata* Nutt. *Phallus caninus*;-- at Castle rock near Vermillion river, 15 miles south of Fort Snelling is the same *Petalostemon* the *Hudsonia* and *Poa* abundant with the *Arbutus uvae ursi* L.;- and at Lake Pepin is the *Salsola depressa* Pursh. almost the only herb besides the *Petalostemon villosus*.

birch and some few juniper shrubs. Pines, yellow and white appear only scattered along the Mississippi, but they are found in extensive tracts and of the finest size along St. Croix and Black rivers.

All these different general characters of the country and its vegetation are alternating from the head of the upper rapids; but the latter is most common to the higher parts of the river between the mouth of Wisconsin and St. Peter rivers.

From the mouth of the L'eau qui court river on the Missouri the hills of the argillaceous bituminous state formation continue (after rising to about 200 feet) for hundreds of miles; or according to travellers information to the mountains. They generally range in three successive ridges of which the middle one is denuded by fire and disruptions, presenting to the eye a continual black left on both sides, giving to the whole region an inhospitable twist and

sterile appearance.

It is a peculiar character of the vegetation of this region that while the forests become less in the number of species, and their trees smaller and inconspicuous; the herbs increase in variety and beauty, in such a way; that a few genera with many species of some tribes, and many genera of a few tribes with few species take the leading features;-- while other tribes, numerous and abundant in the lower regions have here none, or only one single near or distant relative; or on the other hand their most complicated representatives.\*

The river valley is chiefly meadow, the lowest situations near the river only have narrow thickets of red and white ash, American elm, Canadian poplar or cottonwood-trees and ashleaved maple with the common dogwood, fox grapes and few other kind of common shrubs for undergrowth, bordered with meadow plum rose and peterswort shrubs; frequently the poplar alone

\*Out of 89 tribes or families of phanerogamous plants which grow in the United States and Territories, 36 are not represented within the reach of this formation according to my observations. Many of them comprise the most common trees, shrubs or herbs and some the most ornamental of the woods or prairies on the lower Missouri as the **Orchideae**, **Papaveraceae**, **Lauri**, **Annonae**, **Tridens**, **Labiatae**, **Gentianae**, **Campanulaceae**, and others; those which are here in their place are not less beautiful, and remarkable for their fine proportions and colors, many of them for the peculiar scent of their herbage or their odorous flowers some also for medicinal properties which are ascribed to them by professional experienced travellers. Of the **Aroideae** the genus *Potamogeton*. - **Cyperoideae** the genus *Carex*. **Asparagi** the *Smilax rotundifolia* L. **Liliaceae**= *Yucca angustifolia* Pursh. (Adams' needle, bear grass), with a subterranean stem often 4 inches in diameter near the base of the leaves, which are narrow linear, stiff, pungent acute and filamentose, it produces a thick simple scape between 2 and 3 feet high with no less than 6 and up to 15 large white flowers, very nectariferous and of a somewhat oily and disagreeable odour. I am informed by travelers that the inhabitants of New Mexico use the root of this plant for making soap, by boiling it.— **Asphodeleae** = *Allium striatum* Pursh. **Eleagni**= *Shepherdia argentea* Nuttall. **Shymeleae**= *Thesium umbellatum* L. **Amaranthi**= *Amaranthus pumilus* Nuttall. **Nyctagineae**= *Calymenia decumbens* Nutt. **Pedicularis**= *Orobanche fasciculata* Nutt. **Convolvuli**= *Convolvulus*, **Evolvulus**\_\_\_\_ **Polemoniae**=*Collomia linearis* Nutt. **Capparides**= *Cleome dodecandra* Willd. **Acera**= *Negundo fraxinifolium* Nutt. **Geraniae**= *Geranium dissectum* Willd. **Malvaceae**= *Malva coccinea* Nutt. **Cisti**-*Viola Nuttallii* Pursh. **Caryophylleae**- *Linum rigidum*\_\_\_\_ **Saxifragae**= *Heuchera americana*?- **Portulaccaceae**= *Portulacca oleracea*.- **Therebinthaceae**= *Rhus aromatica* titon. **Rhamni**= *Celastrus scandens* Willd. **Vilices**= *Verbena bracteosa* Mchx.0 **Typhae**= *Sparganium*, *Typha*.- **Gramineae**= chiefly *Avenaceae*. *Festucaceae* *Chlorideae*- **Junci**= *Alisma*, *Tradescantia*, *Juncus*, *Melanthium*.- **Polygoneae**=*Rumex venosus* Pursh. *R. perscarioides*.- **Atriplices**= *Atriplex canescens* Nutt. *Atriplex argentea* Nutt. *Chenopodium subspicatum* N.

is thinly scattered along the banks of the river without any other trees or shrubs.

The islands are more densely wooded and the cedar islands have red cedar trees from 30 to 40 feet high and their trunks from 1-2 feet diameter. Those islands of a more recent origin are uniformly covered with the black and long leaved willows, Canadian poplars; and some shrubs of the buffaloe berry and common *Amorpha* are scattered among them. Cedars of fine size grow in the narrow deep ravines and but seldom are they in exposed situations so numerous as on the declivities of the hills near the upper and of the great bend.

The alluvial soil of the of the valley is partly overlaid by a heavy ferruginous impervious loam, brought down from the adjoining hills by the water; on this loam the Missouri wheat scenes to vegetate most freely with a few other fescue grasses, the wall barley

**Plantagineae**= *Plantago major*. *Plantago gnaphaloides* Nutt. *Plant. virginica*. *Plant. pusilla* Nutt.  
**Jasmineae**= *Fraxinus acuminata* Lk. *Frax pubescens* Walter. **Scrophulariae**= *Pentstemon grandiflorum* Nutt. *Pentst. erianthera* Nutt. *Pentst. albidum* Nutt. *Pentstemon coeruleum* and *P. gracile* Nutt. The *Pentstemon grandiflorum* is one of the most ornamental plants of this region; its stem always between 2 and 3 feet high, the leaves somewhat fleshy and glaucous-pruinous, floral ones rounded and acute. The flowers are axillary large, from 5 to 20, of a rose-lilac color resembling somewhat those of *Digitalis purpurea*; grows in fertile and sterile soil and generally in clubs together. Another splendid species of the same genus is the *Pentst. coeruleum* of which I found a small club collected together on the hills near the Shian river. It is less handsome in its proportions but the flowers are almost as large as those of the preceding and of a deep indigo blue. Stem somewhat decumbent. **Solaneae**= *Solanum flavidum* Torr & James. *L. triflorum* Nutt. **Apocynae**= *Asclepias Acerates* *Apocynum*. **Lychoroaceae**= *Lygodesma Sonchus*. **Cynerocephalae**= *Cnicus undulatus* Nuttall. The only thistle of this region. A very showy plant with large undulate spinous and silvery-tomentose leaves; stem seldom 2 feet high, stiff, branched, leafy; flowers large, purplish. In lower situations and other soils the plant looks very different; so that it resembles the perfect plant only in the shape of its leaves and the somewhat glutinous scales of the calyx. There is also a variety with white flowers. **Caprifoliae**= *Symphoria*, *Cornus*. **Umbelliferae**= *Seseli*, *Sium*. **Ranunculaceae**= *Thalictrum*. *Anemone*, *Delphinium*. **Cruciferae**= *Erysimum*, *Cheiranthus Pallasii* Pursh., odorous. *Stanleya pinnatifida* Nutt. The most beautiful of the whole family, its stem about 3 feet high stiff and branching, leaves thick and glaucous; flowers bright yellow, (egg yolk) in terminal racemes from 1 to 2 feet long; (generally, half the length of the stem); visible at the distance of one mile, Grows in clubs together in the intervals of the rocky precipices and also in the valley, most abundant right above the mouth of the L'eau qui court river. Mr. Nuttall has given a very excellent description of this plant in his catalogue of American plants; he took it out of the family of the Capparides described as a species of *Cleome* by Pursh, and placed it properly as a new genus under the family of the Cruciferae. Besides the above 2 is here also the *Thlaspi pursa* L. abundant. **Vites**= *Vitis vulpi*

ley and other herbs among which is the large prickly pear which grows here in every variety of soil wherever it is brought to by accident. Other portions of the valley a little elevated and of a sandy arid soil bear feather grasses, and near the hills they are generally covered with dense bushes of the columbian wormwood, (generally called “ wild sage” by the travellers;); in some localities the shrubby pigweed and long-leaved wormwood shrubs are intermixed with, or in place of the former. The grassy sides of the lower range of hills exhibit a greater variety of herbage; with flower in colors from the purest white of the Oenothera, through all the shades of rose, pink and crimson in the different species of Pentstemon, Astragalus, the sensitive plant and others; often the whole of the lower parts of the hills or intermediate level intervals are so densely covered with the scarlet mallow that the eye must turn away from its brilliancy. The

pina L. Ampelopsis quinquefolia Mx. **Cacti**= Opuntia Dillenii Ker. Mammillaria simplex Haworth. Ribes aureum Pursh. \_The M. simplex attains a diameter of 4 or 5 inches, with bright red crimson-purple flowers; a variety has yellow or whitish spines and pale purple flowers. I never met with the Mamillaria vivipara Nuttall.- **Euphorbiaceae** Euphorbia variegata, E. polygonifolia Jacquin. E. ipecacuanhae. E. maculata L. and others.- **Urticeae**=Parietaria pennsylvanica. Humulus lupulus.- **Onagraceae**= Oenothera caespitosa Ph. a very ornamental plant, stemless, the leaves appressed to the ground, lanceolate, coarsely dentate, tube of the corolla so long as to resemble a scape; corolla pure white turning to a delicate hue of red; very nectariferous. Grows in the precipices of the rocks generally with Astragalus galeoides Nutt. \_ O. pinnatifida Nutt.- A very delicate plant, annual, flowers very large, pure white, sometimes the plants is only 3-6 inches high and erect or 10-12”, branched and prostrate. Grows abundant in the villages of the prairie dogs. O. albicaulis Nutt. herbaceous, stem often so branched as to appear suffruticose, whitish shining, flowers smaller and somewhat lurid white. \_ Grows in loose saline sand. O serrulata N. O. biennis. Gaura coccinea Nutt. belongs to the southern high prairie vegetation. About 1 foot high, perennial, pubescent, glaucous; flowers pale red in the evening when they first open and odorous throughout that night, turn scarlet towards noon the next day and die away.- Torreya ornata Nutt. This magnificent plant grows abundantly in the intervals of the argillaceous slate hills with the Yucca and Stanleya. I have not been so fortunate to see it in blossom though I met with it daily until the 2<sup>nd</sup> of July; some of them were at that date almost 3 feet high.- **Corymbiferae**= Gnaphalium, Chrysopsis, Aster, Solidago Erigeron Diplopappus, Euthamia Kuhnia, Boebera, Donia, Hymenopappus, Helianthus, Rudbeckia, Achillea Artemisia, Xanthium, Iva, Ambrosia.- Donia Squarrosa Pursh. A perennial plant with a single stem when in arid soil or with many from the same root when in rich soil; fastigiate branched, branches 1-flowered; leaves sessile squarrose oblong, acute, serrate glandular-viscous; peryanth secreting a resinous fluid in which it is enveloped, scales squarrose, foliaceous, rays and floscule bright yellow. Travellers have credibly informed me, that a decoct of most resinous parts of this plant is successfully used by the mountaineers and some of the Indians against scrofulous deceases, and that it is likewise prepared and taken as a common beverage. Grows generally with Triticum missuricum as far north as Lake

The adjoining higher denudated hills have less variety of herbs; their slopes are dressed with masses of a species of sunflower and some other smaller herbaceous plants chiefly from the Orache tribe; but out of all, the numerous clusters of Cactus, or prickly pear, are the most conspicuous, when they exhibit their large glittering bronze and golden yellow flowers opened by the bright sun at noon.

The most of these plants are of a glaucous green color, often pubescent or tomentose; many of them silvery-white or very hoary; well fitted to strive for their existence against the combined effects of a parching sun and a sterile soil.

Beyond the last range of those hills the vegetation already partakes somewhat of the character of the high prairies with some modifications, until it falls back to that general uniformity beyond some high range of hills or dividing ridge.

We have now comparatively viewed the vegetation up the Missouri to the

Traverse. **Boragineae**= *Lithospermum decumbens* Nutt. *Batschia canescens*. *Rochelia virginica*. *Onosmodium hispidum* Michx. *Cynoglossum Nuttallii* Sprengel. *Ellisia ambigua* Nutt. *Ell. nyctelea* Lin. **Rosaceae**= *Rosa parviflora* Willd. *Potentilla supina*. *Geum strictum* Willd. *Crataegus crus galli* W. *Prunus rubra* Aiton. *Prunus depressa* Pursh. *Prunus Americana* Marshall. **Leguminosae** = *Sophora trigonella*, *Petalostemum*, *Astragalus*, *Amorpha*, *Lathyrus*, *Psoralea*, *Glycyrrhiza*, *Corrind*, *Orobis*, *Lupinus*, *Schrankia*, *Polygala*, *Fumaria* in about 24 species. **Amentacea** = *Ulmus americana* and *fulva*, *Quercus tinctoria* Bartram very scarce. – *Carpinus Americana* Willd. *Salix nigra* Willd. *Salix longifolia*. *Populus laevigata* Willd. *Juniperus virginiana* Wm.

After comparing and examining specimens from the cedars which grow within that formation with the common red cedar it appears to be the *Juniperus barbadensis*, common to the island of Barbadoes and the West Indies in general. I regret some inattention that I cannot state whether the common red cedar grows intermixed with the former, or if it also ceases with the carboniferous sandstone series near the mouth of L'eau qui court river; the tree is more compact and with much denser branchlets than the common red cedar which appeared to me caused by exposition.

the mouth of Titon river; and that of the Mississippi up to the mouth of the St. Peter river. After describing the lower and most fertile part of the St. Peter we shall proceed in the same way through the prairie regions until we arrive again at the Missouri near the point we left.

The whole country embraced by the lower St. Peter and ~~+ the Cannon river as far south west as the mouth of Aux Liards river of the St. Peters,~~ exceeds any land of the Mississippi above Wisconsin river in quality and quantity of timber and fertile soil. The forests of the valley of the right bank are connected by groves and small wooded streams of the adjoining prairies, with the ~~+ forests of Cannon river,~~ and further they extend so far south west as to embrace the lands of the upper waters of the Ma<sup>n</sup>kato river. The forests trees are chiefly soft maple, American and red elm, black walnut, the nettle tree, basswood, red and white ash; their under growth

Beg.

+ the undine region

+impenetrable forest called Bois francs by the French,

growth\* the common hawthorn, prickly ash, alice, high cranberry, red rod, gray dog wood, fox grapes, horsebriar and moonseed; their herbs the wold and bristly sassaparilla, false cohosh, Indian turnip, the gay orchis and others; rushes and the flowering fern are abundant along the low banks of the rivers. The valley prairies are rich on pasture grasses leguminous and orchideous plants such as the yellow ladies'-slipper,\*\* American and tufted vetsh and others. The lowest parts near the borders of the woods and with those subject to inundations are filled with the high weeds common to such places; as the ragged cup, tall thistle, great bitter weed, the tuberous sunflower and others. Swamps are frequent and some of them contain extensive tracts of tamarack pines. Cedars grow intermixed with red birch on the rocky declivities of the lower Makato river. Red and bur oak with hazel, red root, peters-wort

\*Cratagus coccinea L. Xanthoxylon fraxineum Willd. Viburnum Lentago L. Viburnum oxycoccus Pursh. Cornus sericea Willd. Cornus circinnata L'Herit. Vitis vulpina L. Smilax rotundifolia L. Menispermum canadense. — Aralia nudicaulis Willd. Aralia hispida Mchx. Caulopyllum thalictroides Mchx. Arum thiphyllum Willd. Orchis spectabilis Willd. — Equisetum hyemale Lin. Osmunda regalis Mchx. Osmunda interrupta Mchx. Aspidium filia-femina.

\*\*Cypripedium pubescens Willd. Vicia americana and cracca. Galium tinctorium L. Phlox pilosa. Heuchera americana. Eriophorum virginicum L. Tradescantia virginica L. Zizia aurea & cordata Koch. Pedicularis canadensis. Hypoxis erecta Willd. Stellaria lanceolata Torr. Sisyrinchium anceps Cavanilles. Iris virginica Bowd. Arundo canadensis Mchx. Potentilla fruticosa. Lobelia Kalmii.

wort and the wild rose are the trees and shrubs of the uplands; besides are thickets of poplar--birch frequent in the elevated prairies near the river. The prairies\* are very luxuriant and generally somewhat level and depressed; the gum plant\*\* and buttonsnake root are their most abundant and conspicuous herbs.

The upper lands of the St. Peter above the mouth of Aux Liards river ought not be separated from the lower, on account of their fertility, were they not embraced by the prairie region and a certain limit so naturally marked from here and from Coteau croche on the upper Makato southward by the upper waters of Cannon to the northern fork of the upper Des Moines and from there southwest to the Missouri river; and again from the mouth of Aux Liards river northward along the upper waters of the still higher tributaries of the Mississippi to Red River.

This vast prairie region varies

\*Elevated fertile prairies, which are only in very few places over topped by small ranges of hills partaking somewhat of the soil and vegetation of the high prairie. They are generally as level as level as the banks of their rivers are steep and broken, and in fine proportion to their wood growth. This is especially characteristic to the land of Makato river and its small tributaries.

\*\**Silphium gumniferum* Elliott, *Eryngium aquaticum* Jussieu, *Parnassia caroliniana* Mchx., *Campanula uniflora* L., *Gentiana Saponaria* L., *Lespedeza capitata* Mchx., *Cucubalus stellatus* L., *Galium septentrionale* DeG., *Pycnanthemum linifolium* Pursh., *Gerardia purpurea* L., *Gentiana pneumonanthe*; — *Petatostemon violaceum* W., *Pet. candidum* W., *Aster hyssopifolius* Willd., *Aster sagittifolius* Wedem., *Panicum Muhlenbergii* Sprengel. and other comon plants less abundant among which is the *Gerardia auriculata* from the borders of swamps and the *Lespedeza Stuvei* Nutt. from the high prairie portions near the coteau croche on the upper Makato river.

varies so much in its soils and vegetation that it comprises all the different degrees of fertility in a most singular and pleasant mixture. It would require serious philosophical investigations to speak satisfactorily of its geological features or to track the different periods in which it acquired its present geological character.-- In common terms the whole may be divided in river and lake banks and valleys; prairie islands or groves; wooded ravines; low fertile prairies with slight or conic elevations and high prairies with strong sterile high and low ridges.

As a high elevated country it possesses yet a superior degree of fertility, and it is only owing to the scarcity of wood, that it has been pronounced as inhabitable by travelers.- The annual prairie fires are indeed diminishing the woods every year, so, that whole tracts once thronged with fine oaks are laid waste together with the young growth of

of every year and at the same time penetrating deeper in the remaining growth aided by the dry trunks left by the fire of the past year.

Numerous lakes with fine wooded banks and fertile valleys either meadows or forests give a romantic character to these prairies, so refreshing to the eye of the traveler. They are widely distributed over the whole and especially over the more northern parts of the prairie region, not unlike villages in a civilized country; often situated near fine stream to which they send their waters.- As their number is great it will improve the opinion of the value of the country and the more as the fertile river lands form almost double an addition.

The Pelican lakes on the coteau des prairies near the fertile wooded lands of aux liards river and distantly connected with them by small wooded lakes and groves of nettle tree, elm and basswood in the prairies. The woods of these lakes are extensive

extensive and contain likewise American and red elm nettle trees and bur oak from 40 to 50 feet high and many of their trunks measure from 2 to 3 feet in diameter; American large aspen\*, and white ash grow on the higher banks; hazel, red root peterswort are the common shrubs on the prairies around the woods, and lychnidias, alum root, tufted and American vetch, wood sorrel the most frequent herbs besides sedge and pasture grasses. Rush lake near the upper waters of the Des moines river, a short distance from the Pelican lakes has low and very fertile woods; of the same kind and larger in size. The surrounding prairies are somewhat level and characterized by a multitude of oval or rounded basin like depressions filled with heigh rough grasses, \*\* bordered with the Canadian cinquefoil and germander, besides are the Zigaden, southern lily and button snakeroot the most predominant herbs; large beds of the virginian Strawberry are frequent in the low places

\*Populus grandidentata Michx. Fraxinus acuminata Link. Corylus americana. Ceanothus americana. Symphoria racemosa Michx. Phlox pilosa. Heuchera americana. Vicia americana. Vicia cracca. Achillea millefolium. Oxalis violacea. Panicum (Muhlenbergii Sprengel.)? Heliopsis laevis Pers -- Senecio palustris Hooker. Hippuris vulgaris. Potamogoton crispum. Ranunculus (fluvialitus W.)?\_\_ On the adjoining high prairie Oenothera serrulata Nutt. Pentstemon albidum Nutt. Astragalus hypoglottis. Astragalus gracilis Nutt. Artemisia serrata which is extremely abundant over hill and valley. Especially along the river St.Peters up to Big Stone lake.

\*\* Generally Linnetis cynosuroides W. Potentilla anserina L. Zigadenus glaberrimus Mchx. Liliium Catesbaei Walter. Eryngium aquaticum Juss. Teucrium canadense. Lobelia Claytoniana Mchx. Polygonum amphibium L.

places, and in depressed saline situations appears a species of clover (called—"buffaloe clover" by the travellers) abundant. The lake of the coteau des prairies percees beyond the dividing ridge of the Missouri and Mississippi waters and near upper Big Sioux river and the Indian red pipe stone quarry,\*\* has again fine timbered banks and deep fertile ravines\*\*\* in the neighborhood with strong elms, basswood, hackberry and others. The low grassy valleys abound with the strawberry, canadian cinquefoil and American liquorice. On the arid slopes of the hills I found the pink milk vetch is very abundant and inhabited by millions of Spanish flies! The surrounding ridges of the high prairies abound with the southern lily and the silber leaved Psoralea, leadplant and many other conspicuous plants. The lake of the two Bark Lodges, the extensive Cactus lake and lake of the Two Woods with many small intermediate lakes have all some wood growth, generally American elm

↳ *Lytta vesicatoria* Fabicius. *Meloe vesicatorius* L.

\**Trifolium nanum* Torrey & James.

\*\*\*Here I found the *Habernaria bracteata* Willd. and *Cypripedium candidum* Muhl.

\*\*Vegetation at the Indian red pipestone quarry.- Trees and shrubs: *Quercus macrocarpa* Mcha. *Ulmus americana* and *Fulva* Mcha. *Crateagus crus galli* Willd. *Euonymus atropurpureus* Juss. *Aronia ovalis* Persoon. *Prunus americana* Marshall. *Prunus depressa* Pursh. *Amorpha fruticosa* L. *Vitis vulpina* L. *Ribes triflorum* W. *Ribes floridum* Willd. *Ampelopsis quinquefolia* Mchx. *Celastrus scandens* Willd. *Rhus toxicodendron.* *Corylus americana.*—Shrubs and herbs of the valley. *Symphoria racemosa* Pursh. *Spiraea salicifolia* Aiton. *Salix longifolia* Mhl. (along the creek). *Thalictrum dioicum* L. *Cynanchum laeve* Mchx. *Cucubalus stellatus* L. *Achillea millefolium* L. *Zigadenus glaberrimus* W. *Tradescantia virginica* L. *Oxalis violacea* L. *Allium cernuum* L. *Allium canadense* L. *Euphorbia helioscopia* L. *Lilium Catesbaei* Walt. *Vicia americana* and *cracca* L. *Geum album* Willd. *Lythrum alatum* Pursh. *Alopecurus geniculatus* Muhl. *Beckmannia erucaeformis* Host. *Apocynum hypericifolium* Aiton. *Lobelia Claytoniana* Michx. *Anemone virginiana* L. *Teucrium canadense* L. *Troximon cuspidatum* Pursh. *Limnethis cynosuroides* Willd. *Sparganium ramosum* Swartz. *Polygonum amphibium* L. *Cicuta maculata* L. *Convallaria stellata* L. *Convallaria stellata* L. *Veronica beccabunga.* *Juncus acutus.* *Myriophyllum verticillatum.* *Nuphar advena* Ait. *Ranunculus fluviatilis* Willd.

On the rocks in the valley and on the adjoining rising prairie. *Draba caroliniana* Walter. *Collomia linearis* Nutt. *Cerastium nutans* Raffinesque. *Cerastium dichotomum* Mhlby. *Aquilegia canadensis* L. *Geum rivale* L. *Gnaphalium plantagineum* L. *Veronica peregrina* L. *Arabis stricta* Hook. *Anemone ludoviciana* Nutt. *Thesium umbellatum* L. *Talinum teretifolium* Pursh. *Delphinium virescens* Nuttall. *Potentilla arguta* Pursh. *Potentilla recta* Ph. *Oenothera serrulata* Nutt. *Plantago virginica* L. *Plantago pusilla* Nutt. *Pentstemon grandiflorum* Nutt. *Pentst. gracile* Nutt. *Pentst. albidum* Nutt. *Artemisia frigida* Willd. *Artemis. serrata* Nutt. *Lycopodium apodum* Willd. *Opuntia Dillenid* Ker. *Opuntia fragilis* Nutt.

In the clefts of the rocks and in the shady intervals. *Pteris atropurpurea* L. *Cheilanthes vestita* Willd. *Osmunda regales* Mchx. *Adiantum pedatum* L. On

elm, nettle tree and basswood in their valleys or along the lower, and american large aspen, bur oak, white ash and ash-leaved maple on their higher banks. The lead plant is here more abundant than in any other part and besides the pale rose the only shrub of the prairies. Near the banks of the lakes the prairies have greater variety of herbs,\* and their soil is more sandy. – The sandy beach is generally full of the false mustard\*\* and dwarf amaranths, and the strong grassy borders fringed with dense bushes of the Mimosa\*\*\* and long leaved willow. The adjoining high prairie continues from here with its uniform vegetation, the southern lily still abundant, up to the sources of the St. Peter river and lake Travers.

The valley of the St. Peter above the mouth of the Aux Liards river has much less of wood—growth than the valley below: A narrow forest encloses the stream, for the most part on each side, which is in very few places extensive, only at the lower end of lac Qui parle it

On the ridges of the adjoining high prairies. *Amorpha canescens* Nutt. *Psoralea incana* Nuttall. *Psoralea esulenta* Pursh. *Rudbeckia purpurea* Willd. *Astragalus Laxmanni* Jaquin. *Astragalus hypoglottis.* *Gaura coccinea* Nutt. *Oenothera serrulata* Nutt. *Stipa juncea* L. *Galardia pinnatifida* Torrey & James. *Petalostemon candidum.* *Petalost. violaceum.* *Chrysopsis alba* Nuttall. *Linum rigidum* Pursh. *Pentstemon albidum* Nutt. *Aster sericeus* Vent. *Aster strictus* Pursh. *Solidago nemoralis* Aiton. *Anemone ludoviciana* Nutt. *Helianth. atrorubens* L. *Coreopsis tripteris* L.

\* *Artemisia frigida* Willd. *Artem. serrata* Nutt. *Artem. Gnaphaloides* Nutt. *Chrysopsis villosa* Nutt. *Helianthus tubaeformis.* *Diplopappus pinnatifidus* Hooker. *Cleome serrulata* Pursh. *Atheropogon olygostachyus* Nutt. *Atherop. apludoides* Muhbg. *Verbena stricta* Vent. *Lygodesmia juncea* Nutt.

\*\**Cleome dodecandra* L. *Amaranthus pumilus* Nutt.

\*\*\* *Darlingtonia intermedia* Torrey & James. with *Trigonella sericea* Pursh. *Rudbeckia fulgida* Aiton. *Geum strictum* Willd. *Hedysarum canadense* L.

it exhibits trees which are equal in size to those of the lower forests, and at the confluence of Pommès de terre and Tonza rivers # the forest faintly resemble the latter in the size and vigour of their trees. The valley prairies of the St. Peter above the mouth of Aux Liards river continue almost in the same degree of fertility, rich on different kinds of grasses, several species of orchideous plants\*; gray willow bushes, peterswort, dwarf amorpha and red root shrubs. The adjoining elevated prairies partake somewhat of the high prairies in their growths\*\* In moist and depressed situations # are yet the Zigaden and button snakeroot the most common herbs; <sup>but</sup> with the lower end of Lac qui parle, they take the entire character of the high prairies which was hitherto only local \*\*\* and they continue so, rising gradually up to the Coteau de Prairie. The many small tributary streams and ravines are slightly fringed with bur oak and few other kinds of trees, distantly alternating with large and

#On the granit rocks in the valley grows *Opuntia vulgaris* and *Mamillaria simplex* very abundant and this is probably the most northern place where the latter has been found growing. Here is also the *Houstonia ciliolata* Torrey. Abundant with *Lycopodium apodum* Willd. *Silene antirrhina* L. *Polygala purpurea* Nutt. *Polygala verticillata* L. *Potentilla recta* Pursh. *Potentilla arguta* Pursh. *Panicum* (*scoparium* Lam)? *Allium cernuum* very abundant. *Petalostemon violaceum*. *Geum rivale* L. *Gerardia purpurea* L. *Glycirrhiza lepidota* Nutt. *Acerates viridiflora* Pursh. *Prunus depressa* Pursh. *Aronia ovalis* Pers. *Rhus toxicodendron* and *Amorpha canescens* N.

In the fertile valley grow besides the common high weeds the *Rudbeckia triloba*, *Lysimachia hybrida* Michx. *Hedysarium canadense* L. and here I found also 2 plants of the *Rudbeckia columnaris* Pursh.

\* *Cypripedium pubescens* Willd. *Cypripedium candidum* Muhl. *Habenaria blephariglottis* Willd. *Salix grisea* Willd. *Symphoria racemosa* Pursh. *Amorpha nana* Nutt. *Hedysarum canadense* L. very abundant in the valley of the St. Peter's river up to its sources.

\*\**Coeopsis trpteris* Willd. *Rudbeckia purpurea* Willd. *Linum rigidum* Pursh. *Astragalus carnosus* Nutt. *Pedicularis Canadensis*. *Kuhnia critonia* Willd. *Gerardia purpurea* L. *Solidago nemoralis* Ait. *Anomone ludoviciana* Nutt. *Rudbeckia finata* Michx. *Lechea major*. *Lespedera capitata*.

\*\*\* Near River Eau de vie and Pattersons rapids *Amorpha canescens* Nutt. *Chrysopsis alba* Nutt. *Aster sericeus* Vent. *Rudb. purpurea*. *Liatris resinosa* Nutt. *Stipa juncea* L.

#In all these depressed situations is also the *Neottia cernua* abundant and the only orchideous plant which is found on this part of the coteau des Prairies.

and small lakes, among which is Big Swan lake\* near the mouth of Aux Liard river the most conspicuous with somewhat extensive woods and rich meadows. Fish lake, Sandy and Bush lakes, and the lake of the burned woods and many other small lakes are all sparingly wooded, chiefly with bur oak, white ash and American large aspen. Lake qui parle and big stone lake have but small portions of wood growth in their valleys\*\* and that of the latter by far the most which is narrower than the former and only the deep ravines and on the island are elms and basswood trees of same size; bur oak grows as generally along the high banks. The Truza river with its numerous branches on the coteau des prairies has but few thickets of common shrubby trees in its valley\*\*\*. Wooded ravines and small streams are distantly alternating over the coteau des prairies up to the numerous lakes near the sources of the St. Peter river; which have all moderate growths of bur oak

\*All the lakes whose bottom is sandy and clayey are generally full of the "wild rice" *Zizania aquatica* Pursh. also shallow parts of rivers out of the current; it grows from 3 to 10 feet high and often higher. One of the most ornamental aquatic plants of the North. The low muddy parts of these lakes are generally filled with the *Senecio palustris* Hooker. *Nuphar advena* and *Nymphaea odorata* Ait. *Nelumbium luteum* W. is not very common.

\*\*Here in the Shady wooded ravines grows the *Clematis virginiana* and *Hedysarum acuminatum* Mchx. abundant and are regularly found so in all shady woods or ravines over the whole northern part of the prairie region with them often *Urospermum Claytoni* Nutt. and *Heracleum lanatum* Mchx; and on their borders *Elymus canadensis* L. or *E. virginicus* L. with the *Hyssopus anisatus* Nuttall. and *Monarda didyma*, *Heliopsis laevis* Pers. *Danthonia sericea* Nutt. & others.

\*\*\* In the valley of Truza river appears the *Euphorbia variegata* and *Cnicus undulatus* Nutt.

bur oak, with ash and aspen. The vegetation of their surrounding high broken prairies is more luxuriant than generally; and from their high ridges one may enjoy a view of the most picturesque scenery, over innumerable wooded lakes, ridges and fertile valleys. The somewhat uniform vegetation of the high prairies\*, which comprises so large a portion of the prairie region, is not confined to the coteau des prairies alone; it is found wherever a coarse sand is preponderating in the soil, on the irregular and sometimes conic elevations of the lower or on the higher prairies; and their highest stony ridges; from the summits of which the color of the herbage changes gradually from the grayish green of the leadplant shrub and Psoralea to the liveliest green of the grasses in the valleys. So this growth belongs to the Pomme de prairie of the Canadian or prairie turnip of the American travellers, so valuable a food for the Indians, especially in the regions

Vegetation of the high prairies.

\*Plants, which are found on the high prairies throughout the whole prairie region between the Missouri and Mississippi, and always abundant.-  
 Amorpha canescens Nutt. Petalostemon violaceum Willd. Rudbeckia purpurea Willd. Aletianthus atrorubens L. Stipa juncea L. Psoralea incana Nutt. Aster seiceus Ventenat. Anemone ludoviciana Nuttall.  
Plants found throughout but less abundant.- Artemisia frigida Willdenou. Astragalus laxmanni Jacquin. Astrag. carnosus Nutt. Astragalus hypoglottis. Coreopsis tripteris Willd. Atheropogon oligostachyum Nutt. Atheropogon apludoides Muhl. Euchroma grandiflora Nutt. Petalostemon candidum Willd. Oenothera serrulata Nutt. Linum rigidum Pursh. Artemisia biennis Willd. Psoralea esculenta Pursh. Chrysopsis alba Nutt. Lygodesmia juncea Don. Solidago nemoralis Ait. Anemone virginiana L.  
Plants abundant either N. or South. Chrysopsis villosa Nutt. South - Rudbeckia columnaris Pursh. South - Pentstemon albidum Nutt. South - Gaura coccinea N. South - Galardia pinnatifida Torrey & James. South - Diplopappus pinnatifidus Hooker. South - Aster strictus P. North - Liatris resinosa Nutt. North - Kuhnia critonia Willd. North - Lilium Catesbaei Walter. North - Geum rivale L. North - Potentilla stricta Pursh. North - Heuchera americana L. North —  
Plants only local, more or less scarce. Lespedeza Stevei Nutt. Coteau croche near Makato river of the St. Peters. with Lechea major and minor. - Prenanthes illinoensis Persoon Prairie near the lake of the upper Big Sioux river.- Prenanthes racemosa Mchx. Coteau de Prairie near Big Stone lake upper St. Peter river, and also on the slight ridges near Lake Sakata upper waters of Cannon river.- Phaca caespitosa Nutt. on the slight conic elevations in the level prairies between James and Shienne river. - Saxifraga mista?, on the slight conic elevations in the prairies near Devils lake and Goose river.

Plants local on the high prairie hills of the Missouri river. Polygala alba Nutt. Evolvulus argenteus Pursh. Mammillaria simplex Haworth., also abundant on the high Prairies near the lake of the upper Big Sioux river.- Lithospermum decumbens Nutt. Batschia canescens. Sesleria dactyloides Nutt. Hymenopappus tenuifolius Pursh. Cnicus undulatus Nutt. Delphinium virescens Nutt. Carex filifolia Nutt.  
On the Mississippi.- Viola pedata L. Polygala Senega L. Solidago stricta Aiton. Senecio balsamitae. Batshia Gmelini Mchx. Batshia canescens. Castilleja coccinea.

regions which are no more visited by the buffalo.\*

Another number of larger lakes surrounded with fertile woods are alternating with many small wooded streams and groves of poplar, birch, maple and bur oak; they are scattered remotely over the prairie country between the upper water of Cannon river of the Mississippi and those of the little Sioux river of the Missouri. The most extensive and best wooded of these lakes are lake Izusa near Cannon river with woods of poplar birch, \*\*\* red and bur oak on its high banks; lake Titanka\*\* near Bois franc river has woods of elms, bassewood, soft maple, bur oak, aspen and white ash; lakes Okaman and Wapatah near la Prella river and upper Makato with elm and soft maple trees from 40 to 60 feet high with trunks of 3 feet diameter, besides are the black walnut, hackberry, poplar, white ash and bur oak of large size; lake Omanhunita and Okampidan, the latter remarkable for its beauty

\**Psoralea esculenta* Pursh: (prairie turnip). A small and very well-proportioned plant scarcely a foot high; stem divided symmetrically into alternating incurved branches which form with the tops and digitate quinate leaves an obtuse cone in a perfect plant, very hirsute in all parts; flower heads large conic; obtuse, and about 20- flowered, calyx very hirsute, corolla inconspicuous pale blue; the root resembles a turnip in shape and is very solid and tenacious, and with very little taste; it grows very slow and very old and may be kept dry for many years.- Rev. Dr. Williamson Missionary at Lake qui parle, a skillful agriculturist has attempted to cultivate this plant, but he found the results not encouraging. Roots of plants one year old scarcely attained the diameter of  $\frac{1}{2}$  of an inch, which proofs that the largest of those found in the prairies, and which have generally 2 and often 3 inches diameter must be at least 8 or 10 years old.- As this plant appears only scattered over the high prairie and is daily searched by the Indians and travelers, (and animals), it is probable that it will soon become very scarce, owing also to its slow progress in growing as well as to the scanty quantity of perfect seed it produces; scarcely one fifth part of its one seeded legumes contain productive seed.

Another species of the same genus the *Psoralea cuspidata* Pursh, has also a tuberous root. Its smaller and concatenated tubers are sometimes eaten by the Indians on the Missouri when they can get no other food, but they say that it causes them violent colic. It grows abundant on the Missouri hills above the mouth of Platte river.

\*\* On this lake and almost on all the following grows the *Euphorbia cyathophora* Willd. With the *Cleome dodecandra* L. on sunny sandy and stony parts of the margins of the lakes.

\*\*\**Betula populifolia* Willd. (poplar birch) This appears to be the only tree which could be expected to be transplanted successfully with little human aid over the prairies. It propagates itself spontaneously seed and apparently also from the roots by shoots; it would now form extensive woods in the prairies where there are at present only a grove of 2 or 3 acres kept confined to its limits by the annual prairie fires. The young growth is so dense as to protect each other from violent winds, and other trees especially red oak are suffered to grow up under their protection. It is one of those speedily growing and speedily decaying trees, which attains its full size in 8, 10 or 12 years.- its height is about 40, and the common diameter.

beauty and both near the upper Des Moines river with large tracts of wood-growth and extensive fertile prairies, which resemble in their vegetation the upland prairies of southern Illinois.

Spirit Lake\* at the sources of little Sioux river of the Missouri near the upper Des Moines river is the widest of all the named lakes, surrounded by fine but narrow woods and extensive fertile prairies; American and red elms are here likewise the largest trees from 40 to 50 feet high and 2 feet or more in the diameter of their trunks besides are here also all other kinds of trees common to the lakes, and bur oak, ash-leaved maple and white ash with hazel, rose, field sumach and meadow plum shrubs scattered along the higher sandy banks. The stony and sandy margin of the woods near the lake are covered with long leaved and black willow shrubs and Mimosa bushes, the latter from 6 to 8 feet high.

As this part of the prairie

diameter of its trunks 1 foot. The wood burns very well either green or dry but it is of little value for mechanical purposes.

\*Vegetation at Spirit Lake:

Trees and Shrubs of the woods. = *Ulmus americana* Willd. *Ulmus fulva* Willd. *Celtis occidentalis* Willd. *Tilia americana* Willd. *Populus grandidentata* Mchx. *Quercus macrocarpa* Mchx. *Negundo fraxinifolium* Nutt. *Fraxinus acuminata* Lk. *Salix nigra* Marshall. *Crataegus punctata* Willd. *Prunus americana* Marshall. *Euonymus atropurpureus* Jussieu. *Sambucus canadensis* L. *Vitis vulpina* L. *Smilax rotundifolia* L. *Ribes triflorum* L. *Ribes floridum* Willd. *Rhus glabra* L. *Rhus toxicodendron* L. *Smilax peduncularis* Mhlby. *Amorpha frutescens* L.

Herbs of the woods.- *Eupatorium ageratoides* L. *Urtica dioica* L. *Thaspium barbinode* Nuttall. *Urospermum Claytonii* Nutt. *Arum triphyllum* Willd. *Circaea lutetiana* L.

Herbs of the sandy and stony margins of the woods near the lake: *Darlingtonia intermedia* Torrey & James. *Dalea alopecuroides* Willd. *Physalis viscosa* L. *Rumea persicarioides*. *Polygonum tenue* Mchx. *Potentilla Supina* L. *Agrostis cryptandria* Torrey & James. *Panicum capillare*. *Trigonella sericea* Pursh. *Rumex crispatus* Mchx. *Amaranthus pumilus* Nutt. *Cleome dodecandria* Willd. *Euphorbia cyathophora* Willd. *Artemisia biennis* Willd. *Oenothera biennis*. *Xanthium strumarium*.

On the surrounding low prairies: *Silphium perfoliatum* L. *Helianthus longifolius* Pursh. *Iris cuprea* L. *Pedicularis pallida* Pursh. *Limnitis cynosuroides* Willd. *Leptandra virginica* Nutt. *Teucrium canadense* L. *Polygonum amphibium* L. *Glycyrrhiza lepidota* Nutt. *Gentiana Saponaria* L. *Vernonia praealta* Willd. *Aster novae angliae* L. *Solidago procera* Aiton. *Solidago rigida* Aiton. *Helenium autumnale* L. *Gerardia auriculata* Mchx. *Phragmites communis* Trin.

On the elevated common prairie: *Silphium gummiferum* Elliott. *Baptisia leucophaea* Nutt. *Pedicularis canadensis*. *Galium septentrionale* Roem & Shult. *Aster laevis* L. *Panicum Muhlenbergii* Sprengel. *Gentiana crinita* Willd. *Gerardia purpurea* Lin. *Helianthus atrorubens* L. *Aster hyssopifolius* L. *Polypogon glomeratus* Willd. *Andropogon furcatus* Willd. *Petalostemon violaceum*.

On the adjoining high prairie elevations. *Aster sericeus* Vent. *Aster strictus* Pursh. *Erigeron canadense* L. *Liatris squarrosa* Willd. *Liatris resinosa* Nutt. *Liatris spicata* Willd. *Atheropogon oligostachyum* Nutt. *Atherop. apludoides* Muhlb. *Andropogon scoparius* Mchx. *Solidago stricta* Ait. *Rubekia purpurea* L. *Stipa juncea* L. *Astragalus Laxmanni*. *Gaura coccinea* Nutt. & others

region is of a lower altitude the vegetation is consequently different from the other and more luxuriant. The red root shrub is abundant, especially near the ravines, and peterswort, rose and hazel shrubbery surrounds the woods or fills large portions of the river valleys. The gum plant and wild indigo grow abundant on the more level parts of the prairies; the New England aster, American sneeze weed and soap gentian in the lower boggy parts and borders of swamps. Of the grasses is the common prairie panic grass the most abundant. The high prairie vegetation appears only in very few places, it includes the dividing ridge near Spirit lake and Des Moines river, coteau croche near the upper Makato and a few rolling ridges near Cannon river and lake Wapatah. Large and small swamps\* often enclosed by high wooded banks are a peculiar character of this part of the prairie region; they are generally filled with high sedge grasses,

\**Zizania aquatica* Lambert. *Eriophorum polystachyum* L. *Dulichium spathaceum* Persoon. *Menyanthes trifoliata* Lin. *Utricularia vulgaris* L. *Tris* sp. *Boltonia asteroides* L'Heritier. *Solidago Riddellii* Frank. *Vernonia praeatta* Willd. *Eupatorium perfoliatum* L. *Eupator. verticillatum* Muhlbg. *Euthamia graminifolia* Nutt. *Gentiana saponaria* *Pedicularis pallida* & others.

sometimes intermixed with some wild rice and bordered with asters, goldenrod gentianas and often with the dwarf *Amorpha*.<sup>\*</sup> Through the latter part of the summer and in the beginning of the autumn they exhibit a great variety of flowers in all colors.

The most remote northern part of the whole prairie region and especially the country of Shienne river between James and Red river has the most verdant vegetation<sup>\*\*</sup> though with very different herbage. The valley of Shienne river is wide, very fertile and moderately but almost uninterruptedly wooded.

With the exception of the American large aspen the woods contain all the different kinds of trees common to the more eastern rivers and lakes, besides is the hornbeam here frequent. Elms grow to the height of 50 feet, bur oak to 30 and 40 feet, both averaging about two feet in the diameter of their trunks. In some localities the argillaceous state formation of the Missouri

\* *Amorpha nana* Nutt.

\*\*With the exception of a few herbs these prairies have nothing common with those between James and Missouri river. A proof of their superior fertility and lower altitude is the appearance of prairie shrubs, which is here the American Oleaster (*Elaeagnus argentea* Pursh) in the same measure as the hazel in the prairies of the lower regions. This beautiful shrub fills hundreds of acres; its habitus approaches somewhat to that of the *Shepherdia argentea* Nutt. especially in the color of the bark and foliage, but its branches are virgate and the branchlets unarmed; the leaves ovate oblong undulate subacute and covered with silvery scales, smooth and shining; berries also aggregated around the branchlets roundish-ovate and likewise covered with silvery scales; an eatable dry and farinaceous fruit. The shrub is here scarcely 5-6 feet high and propagates itself the most by shoots from the root like the rest of that genus. It bears much resemblance to the *Elaeagnus latifolia* of Japan and Ceylon.

Next to it are these prairies remarkable for containing a much greater variety of grasses than those further east or south. The Missouri wheat which has been mentioned before covers here extensive tracts on the elevated prairies as well as in the valley of the river. This grass described by Mr Nuttall as *Festuca spicata* has been transferred to the genus *Triticum* by Sprengl, who describes it under *Triticum missouricum* with respect to its strong creeping roots it appears to surpass even the common quack grass, from which it differs in its entirely erect calm, which is stiff and with the leaves strongly nerved glabrous and glaucous. The compressed many-flowered spikelets are alternate; without seeing the spike one might take it as a variety of the common quack-grass. I am informed

Missouri reappears in the valley with several of its peculiar plants\* sparingly scattered over the naked soil.

The level elevated prairie adjoining the valley are about 180 or 200 feet above the latter and seldom overtopped by river hills. The freshness and vigour in the vegetation of these prairies seems to result from a proper mixture of coarse sand and loam which enables the soil to receive and retain moisture in a degree well corresponding with the climate. Rich grasses and leguminous plants render the herbage of these prairies superior to others as pasture for horses and cattle.

At an equal distance from Shienne river and Devils lake an extensive interrupted drift sand plain rises in the same fertile prairie with a large grove of poplar birch in its centre, and trees of the largest size of its kind, surrounded by shrubby thickets of roses and sand cherries. The scanty vegetation

\**Artemisia columbiensis* Nutt. *Euthamia tenuifolia* Nutt. *Chenopodium subspicatum* Nutt. *Atriplex argentea* Nutt.

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informed by practical and observing men, that this grass is extraordinary and unsurpassed by any other herb as a food for horses and cattle; so, that the cattle after eating the first green points of the leaves (which come out as soon as the snow is melted away); for 2 or 3 weeks, th improve so much as on other pasture 6 weeks or 2 months. It continues growing through the whole of the Summer late in the autumn with all its leaves green until the snow covers the plains again. Its leaves are very brittle and have none of those tenacious nerves common to the leaves of other rough grasses. Whatever the value of this grass may be in its natural localities it is not recommendable for cultivation on account of its creeping roots and would soon overrun the whole of the cultivated grounds wherever it was planted, without any probability to extirpate it again. It grows generally by itself scarcely suffering any other herb within its limits, only the *Lepturus paniculatus* Nutt. is abundant among it in the valley of the Missouri river.-

A singular appearance is that of the common rye in such remote region so far off from cultivated lands. It appears scattered over the whole of the prairies between James and Shienne river and beyond the culm very simple, 18 inches high, leaves and sheaths sometimes hairy; the spikes 5 inches long and very attenuated. After a scrupulous examination it proofed to be the common rye *Secale cereale* L.

Another abundant grass is the *Agrostis laxa* Schreber or *Trichodium scabrum* Muhly. it invests all the dry swamps with the *Hordeum jubatum* L. *Calamagrostis mexicana* Nutt. and *Calamagrostis cinnoides* Muhly. in which situations it is somewhat depauperate and pallid; but in the level fertile parts of the prairie it is fresh and generally 18 inches high densely filling every space between the other herbs. Among which is *Linum Lewisii* Pursh. a species of flax (first discovered by Capt. Lewis on the upper Missouri) the most abundant with many other beautiful flowering plant which are generally considered scarce as

vegetation on the driftsand is composed of feather grasses with two or three kinds of herbaceous wormwood that sunflower of the Missouri hills, and few other plants. Saline, sandy depressed situations are frequent in these fertile prairies but never extensive where they appear all other herbs give place to saline plants;\* such as sea millwort, saltwort, samphire, red sandwort, sea pigweed, arrow grass with several species of plantains and others, the most of them are herbs common to sea coasts.

The high prairie vegetation \*\* is here only confined to a few slight conic elevations in the level prairies or to a few high hills along the valley of Shienne and James river.

The woods of Devils' lake and the neighbouring smaller lakes as lake of the woods and chicot lake differ from those of the more eastern lakes in as much as they have no basswood in their valleys, nor aspen on their higher banks; American and red elms with the nettle tree

as *Gentiana acuta* Mchx *Gentiana punitata*? *Gentiana quinqueflora* Fol. *Sisyrinchium anceps* Cavanll. *Astragalus* (*minimus* Pursh). *Evcum* sp. *Oxytropis splendens* Hooker very abundant and beautiful.- Other grasses more or less common are *Andropogon furcatus* Willd. *Atheropogon apludoides* Muhlby. *Atherop.* *oligistachyum* Nutt. *Agrostis brevifolia* Nutt. *Agrostis cryptandria* Torrey *Panicum Muhlenbergii* Sprenzel. *Poa eragrostis.* *Crypsis squarrosa* Nutt with the former in the valley of Shienne river on sand with *Stipa juncea* L. *Triticum pauciflorum* Scweinitz *Aristida pallens* Cavanills.- The swamps are bordered and often filled with the common reed *Phragmites communis* Trin. *Scirpus palustris* L. *Scirpus atrovirens* Muhlbg. *Juncus acutus* L. *Limnitis cynosuroides* Willd. *Polygonum amphibium* Lin. *Lysimachia quadriflora* Sims. *Rudbeckia fulgida* Aiton. *Helianthus angustifolius* Willd. Stem 1 foot high 1-flowered flowers generally monstrosities.

\**Glaux maritima.* *Salsola.* *Chenopodium maritimum* L. *Triglochin maritimum.* *Plantago pusilla* Nutt. *Plantago eriopoda* Torrey & James. *Arenaria rubra* Mchx. *Salicornia herbacea.*

\*\**Petalostemon violaceum* W. *Petal candidum* W. *Scarce.* *Galardia pinatifida* Torrey & James. *Phaca caespitosa* Nutt. *Saxifraga* (*mixta* Pursh)? *Diplopappus pinnatifolus* Hooker. *Artemisia frigida* Pursh. & others.

\*\*\* Vegetation at Devils' lake. Trees and Shrubs of the woods. *Ulmus americana* Willd. *Ulmus fulva* Mchx. *Quercus macrocarpa* Mchx. *Negundo fraxinifolium* Nutt. *Celtis occidentalis* Willd. *Fraxinus acuminata* Link. *Salix nigra* Willd. *Crataegus crus galli* Willd. *Ribes floridum* W. *Ribes triflorum* Willd. *Cornus circinnata* L'Herit. *Prunus rubra* Aiton. *Corylus rostrata* Willd. *Rhus radicans.* *Ampelopsis quinquefolia* Mchx. *Celastrus scandens* Willd. (*Humulus lupulus*) *Rubus strigosus* Michx.

Herbs of the woods- *Actaea alba* Willd. *Actaea rubra* Bigelow. *Aralia nudicaulis* Willd. *Smilax peduncularis.* *Aquilegia Canadensis.* *Viola canadensis* Aiton. *Oxalis stricta* L. *Circaea lutetiana* L. *Convallaria multiflora* L. *Convallaria stellata* L. *Heracleum lanatum* Michx. *Urospermum Claytonii* Nutt. *Sanicula marylandica* Linn. *Chenopodium hybridum* L. *Scutellaria serrata* Pursh.

tree attain the heights of 40 or 50 feet, their trunks about 2 feet in diameter; next to these the ash-leaved maple is with the bur oak of the high banks the largest; the white ash and black willow, wild cherry are small trees of the undergrowth with the cockspur hawthorn, gray dogwood, currant and gooseberry shrubs, poisonous vine, false grape and dense masses of the bristly raspberry. Of herbs are the white and red beads, wild sassa-parilla, cow parsnip and the large purple willow-herb the most abundant the weeds among the hazel shrubs on the higher banks are chiefly blue hyssop, ox eye, narrow leaved sunflower the large meadow rue with some but few plants of the ragged cup and others. The muddy margins of the lake are crowded full of the marsh groundsel and many kinds of short and tall rush-grasses, of which also several species appear abundant along the stony bank favored by the saltwater from the lake. The numerous fresh water springs along the banks of

serrata Pursh.

On the gravelly banks of the lake. Calymenia nyctaginea Mchx Calymenia hirsuta Pursh. Potentilla supina. Cleome dodecandra L. Polygonum erectum. Amaranthus pumilus Nutt. Euthamia graminifolia Nutt. Aster simplex Willd. Epilobium lineare Muhlenbg. Epilobium coloratum Mchx. Dracocephalum virginianum Willd. Ambrosia tomentosa Nutt. Trigonella sericea Pursh.

In the Salt marshes Senecio palustris Hooker. Juncus acutus L. Juncus polycephalus Michx. Juncus acuminatus Mchx. Juncus tenuis Willd. Juncus bufonius L. Soirpus macrostachyus Michx. Scirpus debilis Muhlby. Scirpus atrovirens Muhlby. Scirpus acicularis L. Scirpus tenuis Willd. Scirpus pusillus Vahl. Scirpus polyphyllus Vahl. Scirpus americanus Persoon. Poa distans. Sagittaria sagittifolia. Sagittaria hastata Pursh. Hordeum jubatum. Limnethis cynosuroides Willd. Phragmites communis Trinius. Typha angustifolia.

In the wet meadows: Eupatorium punctatum Willd. Pedicularis pallida Pursh. Parnassia palustris L. Erysimum palustre L. Boltonia asteroides L'Heritier. Sisyninchium anceps Cavanills. Sium lineare Mchx. Lobelia syphylitica L. Lobelia kalmii L. Caltha palustris L. Mimulus rivularis  $\zeta$  (foetid) Stellaria lanceolata Torrey. Bidens pilosa Willd. Gentiana barbata Froelich. Marchantia polymorpha L.

In willow thickets, wet: Epilobium spicatum Link. Epilobium lineare. Epilobium coloratum Mchx. Dracocephalum virginianum. Scutellaria galericulata galericulata L.

About the fresh water springs: Poa aquatica v americana Torrey. Poa elongata Torrey. Poa obtusa Muhlbg. Glyceria airoidea? Caltha palustris. Marchantia polymorpha L. & others named above.

Borders of the woods near the prairie. Hyssopus anisatus Nutt. Heliopsis laevis Persoon. Cynanchum laeve Mchx. Onosmodium hispidum Mchx. Thalictrum nudosum L. Helianthus angustifolius Mchx. Prenanthes serpentaria Pursh. Prenanthes racemosa Mchx. Ambrosia trifida Willd. Lysimachia hybrida Mchx. Convolvulus repens L.- Shrubs Symphoria racemosa Mchx. Corylus. Rosa parviflora Willd. Rosa lutescens Pursh. Rosa (gemella Willd.)?

On the low prairie near the woods. Anemone aconitifolia Mchx. Monarda didyma Solidago serotina Ait. Astragalus minimus? Solidago squarrosa? Nutt. Solidago rigida L. Rudbeckia fulgida Ait. Glycirrhiza lepidota Nutt. Helianthus atrorubens L. Teucrium canadense L. Achillea millefolium. Linum Lewisii Pursh. Allium cernuum Roth. Hieracium prenanthoides Vill. Geranium dissectum. Geum strictum Willd. Campanula rotundifolia Willd. Erigeron canadense L. Erigeron glabellum Nutt. Vernonia corymbosa Sh & Keating. Lysimachia quadriflora

of the lake are dressed with mosses of a beautiful green, species of willow herbs, lobelia and the marsh mary gold, starwort and other beautiful flowers grow abundantly above them. The low meadows or intervals of the woods are boggy, and have a great variety of plants; the narrow leaved water parsnip, the purple Eupatorium and the parnassus grass are the most common besides grow here all the different kinds of plants of the adjoining low prairies.

James river is the least wooded stream of the whole region; only near the confluence of Aux Ormes river the valley exhibits for a short distance some fine elms, bur oak, hackberry, white ash and ash leaved maple trees; of which the elm as usual has the prize for its being always the largest in size, wherever it appears in the prairie regions; the bur oaks are here 30 to 40 feet high, their trunks often above 2 feet in diameter but much divided; In many places the course of the river for many miles is only marked by a few tall trists

quadriflora Lims. Solidago juncea? Boltonia asteroides L'Herit. Apocynum hypericifolium Aitu. Castilleja occidentalis Torrey & James. Geum rivale L. Cnicus undulatus Nutt. Oenothera biennis. Galium septentrionale R & S. Vicia americana and craeca?, Troximom glaucum Nutt. Astragalus carolinianus. Oxytropis splendens Hooker. Shrubs of the low prairie; Amorpha nana Nutt. Spiraea salicifolia Aiton- Elaeagnus argentea Pursh.

Elevated portions of the prairie with high prairie vegetation about Devils' lake. Rudbeckia purpurea Willd. Rudbeckia columnaris Pursh. Helianthus atrorubens Linn. Anemone ludoviciana Nutt. Artemisia frigida Pursh. Artemisia ludoviciana Nutt Artemisia biennis Willd. Diplopappus pinnatifidus Hooker. Sonchus sibericus L. Malva coccinea Nutt. Chrysopsis villosa Nutt. Chrys. alba Nutt. Anemone virginiana L. Psoralea esculenta Pursh. Psoralea incana Nutt. Petalostemon violaceum Willd. Pelalost. candidum W. Astragalus Laxmanni. Astrag. hypoglottis. Gaura coccinea Nutt. Phaca caespitosa Nutt. Liatris resinosa Nutt. Liatris scariosa. Liatris spicata Willd. Lygodesmia juncea Nutt. Linum rigidum Pursh. Donia squarrosa Pursh. Euchroma grandiflora Nutt. Oenothera albicaulis Nutt. Oenothera serrulata Nutt. Pentstemon albidum Nutt. Agrostis brevifolia Nutt. Aristida pallens Caranill. Andropogon scoparius Mchx. Koeleria. Atheropogon apludoides Muhlbg. Atheropog. oligostachyum Nutt. Solidago nemoralis Ait. Solidago puberula? Gallardia pinnatifida Torrey & James. Batshia canescens. Astragalus carnosus Nutt. Potentilla arguta Pursh. Potentilla sticta? Pursh. Saxifraga (mixta Pursh)? Stipa juncea L. Secale cereale L. Aster hyssopifolius.

trist black willow trees scattered along its banks in the valley, and then again it winds itself naked and with incalculable curvings through the wide level prairie. The valley prairies alternating from one side to the other are generally filled with high weeds; and near the woods, peterswort and rose shrubs are abundant with the common nettle.

The prairies embraced by James river and the Missouri have but very few naked lakes, and only few inconsiderable tracts of wood growth along snake river. With the exception of the lands dissected by the latter the prairies have uniformly a very inferior vegetation, especially near James river the grasses are of a dry deadly appearance, and swarms of horse flies are almost the only insect or living being the traveler encounters. The soil of these prairies contains a large portion of vegetable fibre but it is bound by a fine and very ferruginous sand, so, that it scarcely accepts any moisture

moisture, while by the almost total want of loam it can not retain it long, so that after a dry winter the soil is unable to support its growth through the summer season; yet, there are several kinds of plants which are here on their propre soil growing to the highest perfection. A species of yellow cone flower is so abundant that the air is filled with its fragrance, which resembles somewhat that of carnation. It appears collected together in small fields with thousands of its bright yellow flowers interspersed with the flowers of a cinnamon-red variety and the bright golden flowers of *Diplopappus* and *Chrysopsis*.

The heigh prairie vegetation is here also confined only to a few elevations in the level prairies, until the commencement of the high ridges near the Missouri which abound especially with the purple cone-flower, *Psoraleas* and other leguminous plants so abundant on the upper Missouri,

souri, to which we have now returned as to the least valuable in respect to fertility of soil, and quantity of wood-growth.

Minute practical observations on the soil, climate and growth of the whole of this prairie region give the result that the most part of it is fit for cultivation, which will be rendered more easy as the already habitable portions are distributed conveniently for communication. All this however, will never attract agriculturists who are accustomed to wield their ploughs in the deep fertile soil of the lower Mississippi valley, after they have burnt a treasure of the finest timber for clearing; which they would find there very scarce and the soil not half rich enough; against these objections we would state by various proofs, that that soil will produce all the grains cultivated in the northern hemisphere, from the Mandan corn to the buck wheat, with all other field fruits and common culinary

culinary vegetables and all in perfection. With respect to the scarcity of wood the existing woods will extend if protected by settlements, (as it is now recognized in the northern and middle parts of the state of Illinois) from fires, and they must extend also by cultivation beyond want. In short, that country will maintain many thousands of inhabitants, a pastoral and agricultural population which will be equally prosperous and more happy in their fine climate than the inhabitants of the lower regions.

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