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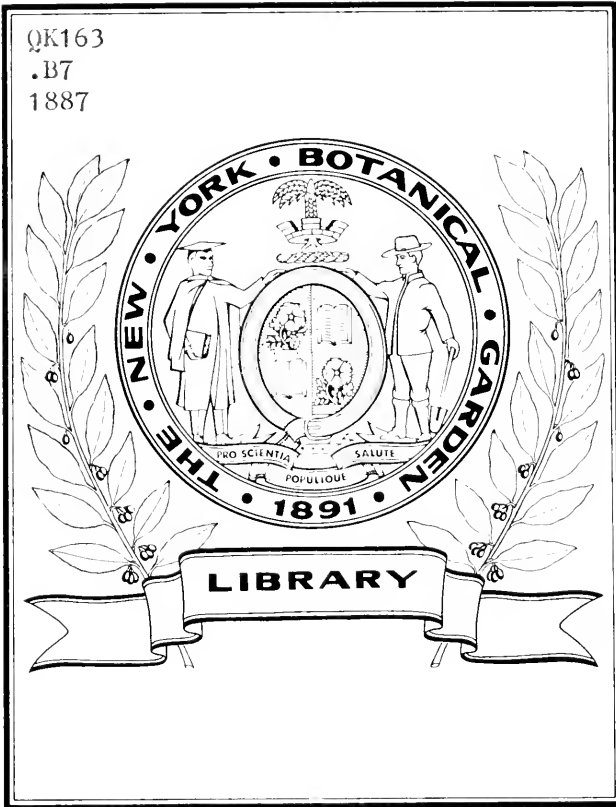
Brendel, Frederick

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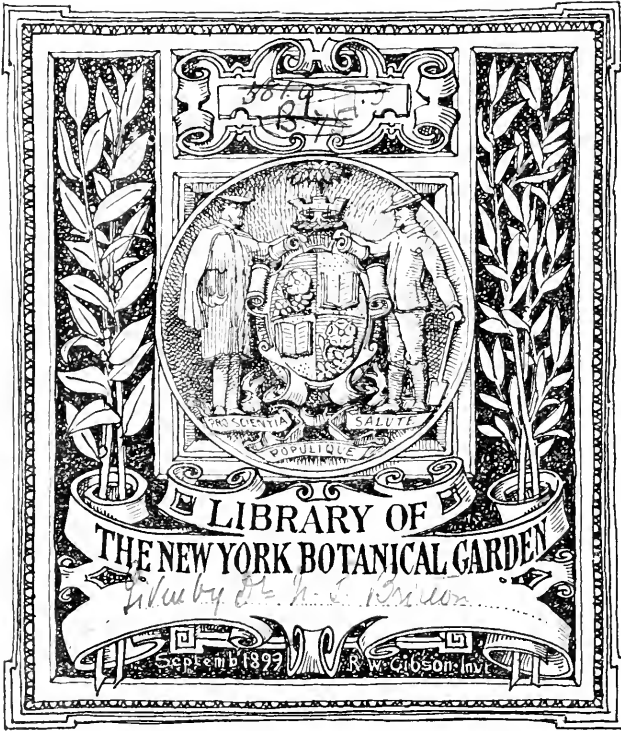




FLORA PEORIANA

BY

FREDERICK BRENDEL.









# FLORA PEORIANA

THE VEGETATION IN THE CLIMATE  
OF MIDDLE ILLINOIS

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BY FREDERICK BRENDEL

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## PREFACE.

The contents of this essay is the result of thirty-five years observations on the vegetation of a small area of about three hundred English square miles. It is intended to show how local floras should be treated to be useful to phytogeography; how notice should be taken of soil and climate, to understand the vegetation of a certain floral district. Descriptions of genera and species are unnecessary, in such treatise, as those can be found in Gray's *Manual*, which, being in every botanists hand, offers sufficient means to identify all the species found in our country.

May this little book take the initiative to similar treatises, that would in a great measure, facilitate the work of a future writer on phytogeography of North America.



## E R R A T A .

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- Page 17, line 11 (from bottom), for 15 read 15.
- Page 20, line 15 (from top), for tribola read triloba.
- Page 20, line 16 (from top), for June 17 read June 7.
- Page 22, line 9 (from bottom), for 27.560 read 29.560.
- Page 25, table, April, column 6, for 11 read 12.
- Page 25, table, June, column 9, for 315 read 316.
- Page 25, table, August, column 5, for 4 read 3.
- Page 25, table, October, column 3, for 35 read 36.
- Page 27, table 8, line 17, for fall read year.
- Page 35, line 21, for Sagifraga read Saxifraga.
- Page 36, line 17, for Saggittaria read Sagittaria.
- Page 38, line 12 (from bottom), for Ipomoce read Ipomœa.
- Page 40, line 24, for Condolle read Candolle.
- Page 43, line 18, after VIII., insert 5.
- Page 43, line 22, for All. read Atl.
- Page 51, line 30, for Eschinacea read Echinacea.
- Page 54, line 5, for S read 5.
- Page 70, last line, for Orhiglossum read Ophioglossum.



## GENERAL REMARKS ON DISTRIBUTION OF PLANTS.

When we study the history of a country, we ought to be acquainted with its geography, its physiognomy of the landscape, its climate and the physical qualities of its people. All these things will influence the moral character of the people and only in that way, combining cause and effect, we will gain a clear view of its history.

Likewise when we study the flora of a country, it is not sufficient to know the names and characteristic qualities of all the species that grow in a certain district; we ought to know the circumstances under which they grow, the topography, the climate, the nature of the soil and the geographical distribution of each species beyond the limits of the country in question.

This branch of science, known by the name of phytogeography, is a comparatively new one; it was founded in the first decennium of our century by Alexander Humboldt, when he published, in 1805, his "*Essai sur la Géographie des Plantes*," and in 1817, his "*Prolegomena de Distributione Geographica Plantarum*."

Since that time many botanists, by treatises on single countries or on single groups of plants, have furnished material to more general works on the subject, f. i., Wahlenberg on the flora of Lapponia, 1812; on the vegetation and climate of Northern Switzerland, 1813; in his *Flora Carpathorum*, 1814. Robt. Brown, in his "General Remarks, Geographical and Systematical on the Botany of Terra Australis, 1814, etc.

The first attempt to arrange the vegetation of our globe into separate geographical divisions was made by the Danish botanist Schouw, in 1822, when he published "*Grundtrack til en almindelig Plantegeographie*," followed in 1824 by an Atlas of twenty-two maps. He used the names of the characteristic orders for each of his divisions: For North America, three only; the most northern, from 50 N. L. northward, he called the Kingdom of Saxifrageæ and Mosses; the Northern United States and Canada formed that of the Asters and Solidagines; the Southern States that of the Magnolias. The country between the Rocky Mountains and the Pacific Coast, the flora of which was at that time nearly unknown, he passed by. Meyen, the botanist of the Prussian expedition around the world in 1830-32, published in 1836 a general work on the Geography of Plants. The most important works on the subject are the "*Géographie Botanique*," by Alph. De Candolle (1855), and "*Grisebach's Vegetation of the Earth*," in 1872.

Grisebach's botanical provinces are much more natural than Pickering's quite artificial divisions in U. S. Expl. Expeditions, XV; but in regard to the causes that effected the distinct floras, he is rather one-sided; excluding all geological causes, admitting of recent agencies of migration only, and refuting the theory of transmutation of species, he adheres to the obsolete belief in general revolutions of the globe and new creations. As some other prominent scientists, he seems to be influenced by hereditary religious prejudices. However his arrangement of botanical provinces may partly be retained, as far as new discoveries in less thoroughly examined countries will not demand some changes, as proposed by A. Engler, in his *Essay on a History of Evolution of the Vegetable World* (1879-82), and by O. Drude (*Florareiche der Erde* 1884), who both differ from Grisebach in their argumentation acknowledging transmutation of species and geological agencies.

The limitation, not only of species but of whole genera, and even orders within continents or certain parts of the same, created the idea of a plurality of primitive centres of creation and of a phytogeographical significance of endemism and of monotypes. This view, and the denial of a genetical connection of the species through all geological periods agrees perfectly well with a dualistic conception of cosmogony, the hypothesis of an arbitrary power, that created highly organized beings by an immediate will and placed each kind at a certain locality of our globe.

A more probable hypothesis is the modern monistic biological theory: By an unknown compulsive force are uninterruptedly produced new forms out of older ones, and more perfect ones, beginning with the most simple organizations, so that the recent forms, by convenience called species, are genetically connected with the extinct.

Species become extinct in certain localities and are preserved in others; only that way we can understand the co-existence of one and the same species in widely disjoint countries, f. i., of our *Phryma leptostachya* in North America and the Himalayas; for nobody would believe that this plant has a double origin, and the only explanation of this fact is that the plant had formerly a wider distribution, and became extinct in countries between the actual habitats. Several species of *Liriodendron* are found in the Miocene formation of Greenland, and, besides, in Germany and Italy, when now only one species exist in North America; so the *Taxodium distichum*, another North American tree, was found in the bituminous slate-clay of Spitzbergen. Therefore, quite properly Bentham proposed, instead of centre of creation, the term centre of preservation.

The above mentioned species show that endemism has nothing to do with origin, but only preservation, and that only in that sense it is of any value in phytogeography. Monotypes are very often the arbitrary make of systematics, and depend of their proneness to narrower or wider limitation of species and genera. *Hepatica triloba* is a monotype as soon as we separate it from *Anemone*, and as soon as we unite with it the other



little founded species. But when we acknowledge the latter as "good" species, then it ceases to be a monotype. *Pentachæta* was, when Nuttall proposed the genus, a monotype until A. Gray described a second species, and with that as a variety, another monotype: *Aphantochæta*. So both of them cease to be monotypes.

Of eight other genera of the order *Compositæ*, which Grisebach mentions as monotypes (in *Vegetation of the Earth*), only two: *Whitneya* and *Crocidium* retain yet their monotypism: *Actinolepris* merged in *Eriophyllum*, *Oxyura* in *Layia*, *Coinogyne* in *Iaumea*, *Tuckermannia* in *Leptosyne*. *Corethrogyne* is now represented by three *Hulsea* by six species, and besides two varieties. In the meantime not less than ten California monotypes are proposed, the greater part, probably, waiting for the company of new foundlings.

These few examples, out of many, will show the value of monotypes the more when we add the above mentioned *Phryma*, which is not only a monotype genus, but after Schauer, even a monotype order, and does exist in two so remote countries.

In undisputed monotypes what else can we recognize but the isolated remnants of an extinct plurality of forms, isolated by a row of geological and climatological changes? Analogous examples are offered in Zoology, when we compare the small number of recent ganoids with their abundance in early geological periods.

Comparatively few species of plants are distributed all over the surface of our globe, of which a large proportion again proved to have spread by migration, even in historical time. The great majority of species is restricted to certain areas within certain limits that are defined by climatical influences as heat, light, humidity, or by physical or chemical qualities of the soil, or by geographical obstacles as are oceans, deserts or high mountain ranges, which a species may be unable to pass over.

The assemblage of species which, under the above mentioned influences, grow in a part of our globe, giving to the same its characteristic physiognomy, we call the flora of that country and the area to which it, as a whole, is restricted, we call a botanical province with subordinate regions and districts. It is evident that political boundaries must be excluded; the flora of a state may be quite different in its parts, f. i., in Virginia the flora is different in the Atlantic slope, in the Alleghanies and in the Western slope, and belongs, accordingly, to three different botanical districts, as will be shown.

To arrange the vegetable world geographically into natural provinces and districts, the best guide will be the character of the landscape and the statistic proportion of the species, genera and orders. Climate and nature of soil will serve to elucidate the facts.

Species, genera and orders, may be limited by lines, and so may be determined the area of each, but it will not do for the complex of them. For these lines will, in many ways, cross each other, and so the character

of the landscape will not abruptly change; species after species will disappear and new ones will present themselves.

Traveling from the Atlantic westward, we find at first deciduous-leaved trees and coniferæ; on the Alleghenies, the same, with an additional number of Ericaceæ; then west of the Alleghenies, in the Ohio Valley, deciduous-leaved woods; on the Upper Mississippi, the same, interspersed with prairies, which prevail west of the Mississippi, only the banks of the rivers being wooded, and farther westward the trees disappear entirely. The similar changes take place going from the north to the south.

An early publication on the geographical distribution of North American plants, is Barton's specimen of a geographical view of the trees and shrubs of North America (1809), of the newer ones the most important are: Richardson's Chapter on Woody Plants and Carices, in the second volume of his Arctic Searching Expedition (1850;) then Cooper's Paper in Smithsonian Reports (1858), on the Distribution of the Forests and Trees of North America; A. Gray's Statistics of the Flora of United States (1856); Gray and Hooker's: The Vegetation of the Rocky Mountains in Geological and Geographical Survey of the Territories (1881), and finally Sargent's Forest Trees of North America, in Vol. IX of the United States Census (1884.)

For North America, I propose the following floral divisions:

1. The Arctic Alpine.
2. The Woodland.
3. The Californian.
4. The Prairie.
5. As a part, or at least a transition to the West Indian Flora, that of South Florida.

1. The Arctic Flora, which is nearly the same as in the eastern continent, covers all the country northeast of a line drawn from the mouth of the Mackenzie to the Hudson's Bay, under 60° north latitude, and north of a line from the mouth of the Mackenzie to the northwest coast under 66° north latitude; then that part of Labrador that lies north of 59°, and the highest points of the Rocky Mountains, Sierra Nevada and White Mountains. Characteristic is the absence of any tree-growth. The whole Arctic Flora does contain not quite four hundred and fifty species of vascular plants, and many mosses and lichens.

2. The North American Woodland, comprising the greater part of the continent from the Atlantic to the northeast, from Labrador and North Florida to East Texas, Missouri and the Lower Saskatchewan, could be sub-divided in the following provinces: A sub-arctic province from Alaska to the Hudson's Bay, an uninterrupted forest of coniferæ, mostly *Pinus alba* and a few pópłars, birch, alder and willows. A North Pacific Province: The coast from the peninsula Alaska, to the Oregon and the wooded part of the Rocky Mountains, have

more or less the same flora, with peculiar coniferæ and trees with deciduous leaves; southward, increasing in number of species and passing over into the Californian province. A Province of Mixed Forests: Coniferæ and leaved-woods, occupying the tract of land from Lake Winipeg and the great lakes to Nova Scotia and New Jersey; and, southward, in the Alleghanies to Georgia. This should be divided in three districts: (*a*) Around the great lakes (Canadian) coniferæ prevailing; (*b*) coast from Nova Scotia to Delaware, North Atlantic, deciduous trees prevailing; (*c*) Alleghanies, coniferæ, with many Ericaceæ and some Magnoliaceæ. A Province of Deciduous-leaved Trees with two districts: (*a*) The Ohio Valley, with nearly exclusively deciduous-leaved trees; (*b*) the Upper Mississippi, with deciduous-leaved trees and prairies, the former, westward, decreasing in number of species. A Province of Evergreen-leaved Trees, between the Atlantic coast from Virginia to North Florida, and along the Gulf of Mexico to the Brazos, in Texas. This could be divided in an eastern and western district, but the number of species, common to both, is so great, and the character of the landscape so similar, that it is not advisable. The area is coincident with that of the tertiary formation.

3. The California Flora, from San Diego to the Columbia River, and west of the Sierra Nevada. These mountains, as well as the coast range, are covered with many peculiar species of coniferæ. The valley of the Sacramento and San Joaquin is sparsely wooded mostly with oaks, among which are several perennial-leaved species. In the coast range, north of San Francisco, the thick forest does consist mostly of the same species in one locality, and of another in the next *a. s. o.* Southward of San Francisco the forests grow thinner and thinner, with only a few coniferæ, and at Santa Barbara the mountains are nearly bare or covered with low shrubs. There is the transition to the North Mexican Flora.

4. The region of the prairies is characterized by a dry atmosphere, little precipitation and partly absence of any tree-growth.

The northern part, known as the plains ( $54^{\circ}$ — $38^{\circ}$  north latitude), is divided from north to south by the Rocky Mountains, and has on both sides the same flora, crossing the lower parts of the mountain-range. Amongst the characteristic plants are the most common several species of *Artemesia*, known under the name "Sage."

The southern part, comprising Arizona, southeast California, the southern parts of Nevada and Utah, New Mexico, West Texas and North Mexico is characterized by many species of Cactaceæ, and thorny, woody plants, mostly small trees. There are many peculiar Compositæ of which, out of two hundred and twenty-one North American genera, one hundred and sixty-five are represented in this province; and of these again seventy-one do not extend to California and to the East neither. Out of fifteen hundred and thirty-five North American species of this order seven hundred and forty-four we find there, and of those five hundred and forty-two only in this province, although many of them in tropic America.

5. South Florida is included, by Grisebach, in his large province of North American forests. In his "Geographical Distribution of West Indian Plants," he says that only a few woody plants, common to West India, occur in Florida and the Keys (fourteen he mentions). The reason why, I suppose, that the flora of South Florida is a part rather of the West Indian than of the North American flora, I have shown in an article in the *American Naturalist* about ten years ago. At that time, I proved that two hundred and forty-seven species, mostly West Indian, occur in South Florida that do not extend into Florida, or any of the South-eastern States; further, that amongst these there are not less than one hundred and thirty-six woody plants, and it must be remarked that a number of introduced species was not included. In the meantime a supplement to the *Flora of Chapman* was published, furnishing to the above number an addition of more than a hundred species of vascular plants, so that now three hundred and sixty species (mostly West Indian) are known in South Florida, that do not pass beyond the  $29^{\circ}$  of north latitude; one hundred and sixty-nine species belong to one hundred and thirty-four genera, which are not found farther northward, and of these again two hundred and ninety-five species are of sixteen orders, not represented in Northern Florida. Besides these we find in *Chapman's Flora* one hundred and eighty-nine species that do not pass over the northern State line of Florida, although some of them occur westward along the gulf shore. These are certainly of southern origin; so we have five hundred and fifty species, nearly all West Indian.

About fourteen hundred and forty species we find in *Chapman's Flora*, the habitat of which is said to extend to Florida, that means always the northern part. There is no full list of the plants of Southern Florida published, so that we could know how many of those northern species reach South Florida; but it is not probable that more than two-fifth of the above number will be found there. That would be equal to the number of southern species. As the exploration of the inner parts of the country, specially the everglades, is not finished, many more southern species may be found, when we consider that in the last ten years the number of known South Floridan species increased at the rate of forty-six per cent.

So we may conclude that the *Flora of South Florida* is composed of an equal number of North American and West Indian species, and it is probable that the latter will prevail.

There is no doubt that the fauna, especially the insect-fauna of a country, must be adapted to the flora; the areas of both will nearly be coincident, as we find it on a map representing the zoogeographical provinces in the third Report of the United States Entomological Commission (1883). And there we notice a fact of great interest: The southern part of Florida is separated from the Atlantic and united with the West Indian Province.

## TOPOGRAPHY.

## GEOLOGICAL FORMATION AND SOIL.

The country which the Illinois river is traversing is a plain, cut in by valleys 30 — 60 meter deep, and very slightly sloping from the northeast to southwest, as will show the elevations of the following points: The Mississippi, at low water at Dubuque, is said to be 186 meter; at the mouth of the Ohio, 83 meter; the water-shed between Lake Michigan and the Des Plaines river about 190 meter. Between Rock river and the Mississippi there are single hills rising to an elevation of 375 meter above the sea level, and 90 meter above the surrounding country. The River Des Plaines, running in a distance of a few miles along Lake Michigan, unites under  $41^{\circ}20'$  north latitude with the Kankakee coming from Indiana, and from there the river is called Illinois, running for sixty miles due west; then for about one hundred and eighty miles in a southwesterly direction, and empties into the Mississippi under  $30^{\circ}50'$  north latitude, 122 meter above sea-level. The descent is, in average, 14 decimeter per mile. About one hundred and forty miles above the mouth is Peoria, situated on the right bank upon two terraces, the first of which is 15 meter, the second, a little over 60 meter above low-water mark. Between the two terraces runs parallel with the river a depression, no doubt once a slough; the lower terrace, being an old sand-bank, rises at the lower end in a sand-hill, which was probably formed by a counter-current coming from the Kickapoo Valley, and shutting up the slough. This process was probably going on about the end of the drift period, but may be observed to-day on many rivers of the West. The second terrace, of equal height with the bluffs on the east side of the valley and about three miles distant, formed the oldest banks. The bluffs do not run in a continuous, straight line, but are interrupted by shallow or often deep ravines. The river, widening fourteen miles above Peoria, forms a sheet of water called Peoria lake, which at the lower end is about 1,600 meter wide. From there the stream keeps an average width of 270 meter.

In spring the river does rise from low water (140 meter above sea-level), 6 meter and then on the left bank the bottom-land is overflowed. The lower end of the lake was, thirty years ago, much wider than now, a little creek coming from the east, often changing channel, formed in the meantime not less than eighty or one hundred acres of land, partly covered already with cottonwood and willows, and increasing in a direction against a narrow strip separating a slough from the river. Should, in the course of time, the opening, left yet, be shut up, the slough will, drying up, turn in a prairie: the same process that was going on in the past on the right bank. Two miles farther downward the river bends and the bluffs border the left bank, the bottom-land being on the right side, where the Kickapoo creek enters from the west through a narrow valley with steep bluffs and numerous coal mines.

The great coal-field, occupying two-thirds of the State of Illinois, is covered by the northern drift, which is spread over the Northern Mississippi Valley southward to 39° north latitude. That this drift once filled the whole river valley, and that this was afterward washed out, is sufficiently proved by the large boulders found along the river banks, granite, syenite, diorite, porphyry, etc., that were brought by icebergs from the far north and dropped during melting; they were left when the softer material was floated away.

The bottom soil is alluvial; on the upland we find, below the humus, a subsoil of alternating layers of loam and gravel. There is no limestone soil, or very rare. There is little chance in the flora of Peoria to make observations on relations between chemical qualities of the soil and vegetation, if we would not attribute significance to the growth of certain grasses on pure sand soil. It is always the physical condition the habitat of each species depends upon: exposition to sunshine or shade, loose or compact ground, dryness or humidity of the soil and similar contrasts are favorable or exclusive.

### CLIMATE.

As generally in the middle parts of the great continents of the northern hemisphere our climate is an excessive one. Hot summers, cold winters and a rapid change of temperature at all seasons is the character of this climate.

TABLE I.  
TEMPERATURE, DEC. 1, 1855 TO NOV. 30, 1885.

	Before sunrise	7 a.m.	2 p.m.	9 p.m.	Mean	Max.	Min.	Frost Days.	Days Maximum not above freezing point.
December.....	24.5	24.5	33.3	28.6	28.6	71	-22	24	13
January.....	19.4	19.4	29.5	24.3	24.3	65	-27	27	17
February.....	23.5	23.5	35	29.8	29.2	70	-15	22	10
March.....	31	32.4	44.8	37.6	38.1	79	-6	18	5
April.....	42.7	45.8	59.7	50.6	51.7	88	18	5	.....
May.....	54.4	58.5	72.5	62.2	63.8	98	30	0.2	.....
June.....	63.5	68.5	81.6	71.6	73.3	100	35	.....	.....
July.....	67.6	72.6	86.3	76.1	77.7	104	48	.....	.....
August.....	65.5	69.5	84.1	73.6	75.2	105	41	.....	.....
September.....	57.7	60.6	75.9	65.2	66.7	98	34	.....	.....
October.....	45.8	47.3	62.4	52.7	53.7	90	14	3	.....
November.....	33.8	34.2	45.5	38.9	39.4	77	-1	14	3
Year.....	44	46.4	59.2	51	51.9	105	-27	113	48

The range of the thermometer scale in thirty years comprised 132° and nearly the same (127) even in one year 1872, when in January the minimum was -22 and the maximum in August 105. The lowest stand of the mercury—27 was observed on the 5th of January, 1884. The greatest range in one month (January, 1874,) was 87° from -22 to 65,

and the greatest range in twenty-four hours was observed 1876 in January 28th, 2 p. m., to 29th in the morning the mercury fell 53° from 61 to 8, and again 1881 in January 13th to 14th falling from 34 to -10. Such high daily oscillations are frequent, particularly in February, December and April, and even in July the greatest difference in twenty-four hours was 37° (1860 2d to 3rd.)

To show the march of the mean temperature from day to day during the year the mean for each day (in thirty years) is computed in table two.

TABLE 2.  
DAILY MEAN TEMPERATURE, 1855 TO 1885.

	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.
1	34	23.1	24.7	35.9	44.5	55.9	68.4	75.4	77.9	71.4	61.7	46.6
2	34.8	23.2	24.7	35.4	46.5	55.4	69.5	76.5	76.9	71.4	63.2	45.5
3	34.1	24.1	24.3	32.1	48.5	58.6	69.9	77.7	76.2	71.7	62.5	45.2
4	34.7	22	23.1	30.7	48	60.5	68.8	78.3	76.3	71.5	59.3	47.6
5	34	23.1	25.8	34.4	47.8	60.2	70.8	78.6	76.9	71.4	58.6	44.7
6	32.7	22.6	29.5	36.9	48.2	59.3	70.6	78.8	76.9	70.9	58	45.6
7	30	22	28.4	35.4	49.1	62.1	71.9	78.3	77.6	70.9	60	47.3
8	28	20.7	27.4	36.8	47.9	63.3	70.9	79.2	77.4	70.5	58.5	45.9
9	30	21.6	24.6	35.5	48.5	62.1	70	79.1	77.3	69.7	58.3	43.2
10	30	23.5	28	37.2	48.7	61.3	69.6	77.1	76.8	68.5	56.9	43
11	30.6	25.7	30.9	35.8	49.6	61.6	71.4	77.3	76.5	67.5	55.3	43.4
12	32.8	28.5	30.1	36.2	48.8	62	72.2	78.2	76.3	67.2	54.9	40.8
13	31.4	24.6	27.1	36.5	51.9	60.8	72.4	78	75.2	67.6	54.5	40.6
14	27.7	24.8	27.6	38.8	52.4	61.6	74.1	79.9	75.2	67.8	54.9	38.3
15	27.5	25	29.5	37.4	49.3	62.9	73.4	79.8	74.9	68.2	55.2	38.4
16	28.4	22.1	30.2	35.7	49.5	63.5	73.4	80.4	75	67.8	54.8	40.2
17	26.6	21.1	29	36.3	52.6	64.2	72.9	77.6	75.4	66.4	52.9	38.9
18	27.6	23.4	30.2	37.9	54.6	64.9	73.5	77.5	76.5	65.9	50.2	37.1
19	27.3	24.7	29.7	38.4	54.7	66	73.5	77.2	75.8	64.3	50.7	35
20	25.7	25.4	30.9	36.9	53.9	65.9	73.7	76.9	75.4	61.5	51.5	35.1
21	26.1	25	30.1	37.1	54.7	64.6	73.9	76.4	74.9	62.3	52	34.8
22	22.8	25.2	32.3	41.4	54.4	66.5	76.6	76.6	73.8	64	49.3	35.2
23	21.9	25.4	30.5	40.4	52.5	68.2	78.4	77.1	73.9	65.6	47.9	32.8
24	24.7	25	31.3	39.5	53.8	70.3	78.4	77.9	73.8	63.9	49.4	33.1
25	26.2	26.1	33.8	39.6	56.1	68.8	76.8	78.4	72.6	62.8	50.4	35.6
26	27.4	28.3	35.2	42.3	57.2	68.2	77.6	77.5	73.4	62.6	49.6	35.7
27	26.2	27.1	34.7	43	56.6	67.4	77.1	78	74.4	63.3	49.3	34.6
28	27.5	25	34.6	43.9	55.6	67.7	77.2	77.1	72.6	62.6	49.9	35.9
29	25.9	25.3	.....	42.9	57.6	68.1	76.7	75.9	71.3	62	47.8	31.6
30	25.8	27	.....	44.5	56.2	67.9	76.7	77.3	71.9	60.8	45.6	31.8
31	24.4	25.7	.....	45.6	.....	69	.....	74.5	73	.....	42.7	.....

From the 5th of March the mean keeps above the freezing point, rising by and by with little oscillations to the maximum mean on the 16th of July (80.4,) then it falls slowly to the middle of September, and more rapidly to the 29th of November, when it reaches the freezing point, under which it keeps from the 7th of December to the 21st of February, with the only exception on the 12th of December. From the 22d of February to the 5th of March only the 23d and 24th of February and the 4th of March have the mean temperature below freezing point.

There are small oscillations in spring and fall, the depressions of which may be filled after longer observations, but those in winter are too

great, not to be considered as more constant, as well as those between the latter part of May and the end of July.

Comparing the result of the thirty years observations with the march of temperature of a single year we find the latter much more irregular. In 1858 after a very mild January followed a severe February, and the first decade of March was colder than the first decade of January. In 1869 the first decade of February was the coldest of that winter and March colder than January.

The mean temperature of Peoria is about the same as that of Paris, in France, under  $48^{\circ} 50'$  north latitude, that is  $8^{\circ}$  farther north than Peoria. We find for spring and fall about the same temperature in both localities, but a great difference for summer and winter.

	WINTER.	SPRING.	SUMMER.	FALL.
Peoria .....	27.4	51.2	75.5	53.2
Paris .....	38.5	50.5	64.6	52.5
Difference ...	8.9	0.7	10.9	0.7

Rome, in Italy, about  $1^{\circ}$  farther north than Peoria has a mean temperature of 60.8, in summer 74.3, in winter 50. That makes the mean temperature of Rome about  $9^{\circ}$  and in winter  $22.6^{\circ}$  warmer than in Peoria and the summer is nearly  $1^{\circ}$  colder. These examples may be sufficient to show the difference of climate of western Europe and the central parts of North America.



## WINTER.

TABLE 3.

	FROST DAYS.		Days betw'n	No. of Frost Dayr.	Days not above freezing point.	FROST DAYS.		
	First.	Last.				Before.	Dec. Jan. Feb.	After.
1856-7	Oct. 1	May 11	223	142	63	26	74	42
1857-8	Oct. 20	Apr. 26	189	112	36	19	73	20
1858-9	Oct. 9	Apr. 23	197	96	35	14	67	15
1859-60	Oct. 9	May 1	206	120	47	17	82	21
1860-1	Oct. 12	Apr. 19	190	116	53	20	74	22
1861-2	Oct. 24	Apr. 6	165	114	57	17	78	19
1862-3	Oct. 24	Apr. 8	167	112	22	28	58	26
1863-4	Oct. 6	Apr. 21	198	109	38	23	66	20
1864-5	Oct. 9	Apr. 24	198	104	44	16	72	16
1865-6	Oct. 28	Apr. 7	162	107	50	12	75	20
1866-7	Oct. 31	May 8	190	118	61	12	73	33
1867-8	Oct. 24	Apr. 18	178	115	58	14	84	17
1868-9	Oct. 8	Apr. 14	189	112	45	14	70	28
1869-70	Oct. 13	Apr. 17	187	126	41	33	73	20
1870-1	Oct. 31	Apr. 1	153	92	38	10	71	11
1871-2	Oct. 28	Apr. 22	178	130	57	16	85	29
1872-3	Oct. 11	Apr. 25	197	124	73	20	84	20
1873-4	Oct. 7	Apr. 29	205	130	40	29	68	33
1874-5	Oct. 12	May 2	203	131	74	20	80	31
1875-6	Oct. 11	Apr. 5	178	98	36	19	55	24
1876-7	Oct. 15	Apr. 5	173	122	61	16	79	27
1877-8	Nov. 3	Mch. 25	143	51	15	9	41	1
1878-9	Oct. 19	Apr. 5	169	113	53	14	80	19
1879-80	Oct. 24	Apr. 12	172	92	28	16	54	22
1880-1	Oct. 18	Apr. 16	181	143	83	26	84	33
1881-2	Nov. 9	Apr. 12	155	93	24	15	61	17
1882-3	Nov. 12	Apr. 24	164	120	63	13	80	27
1883-4	Nov. 1	Apr. 8	160	106	58	13	76	17
1884-5	Oct. 23	Apr. 13	173	112	67	12	74	26
Mean .....	Oct. 18	Apr. 17	180	112	48	18	72	22

The three winter months together had the lowest mean 20.7 in the winters from 1872 to 1873 and 1874 to 1875.

Above freezing point was the mean of the winters 1862-63, 1875-76, 1877-78, and 1879-80; in all the rest it was below freezing point.

The coldest January was that of 1857, 13.5; the coldest February 1875, 15.5; the coldest December 1876, 18.5.

The warmest January was in 1880, 40.9; the warmest February 1878, 37.5; the warmest December 1877, 44.3.

The coldest decade in January was 1864 1st and 10th, 0.2; in February, 1875, 10th to 20th, 8, and in December, 1872, 21st to 31st, 8.8.

The warmest decade in January was in 1864, 21st to 31st, 41.8; in February, 1871, 21st to 28th, 41.2; in December, 1862, 21st to 21st, 41.7.

When we call the three months December, January and February the three winter months, it is obvious that this is mere theory. Practically winter is not restricted to those three months; there are no general limits which are good for every year. When we take freezing as a dis-

tinctive quality of winter we find its limits very variable in different years. The mercury is falling below freezing point in a period commencing on the 1st of October and ending on the 11th day of May, so that the first frost days in the thirty years occurred between the 1st of October and the 12th of November; the last between the 25th of March and 11th of May.

The longest of those periods was in the winter from 1856 to 1857, the first frost was noticed on the 1st of October and the last on the 11th of May, a period of 223 days.

The shortest was that from the 3d of November, 1877, to the 25th of March, 1878, a period of 143 days. The former contained 142, the latter only 51 frost days. Computing the average we find the first frost day to be the 17th of October, for the last frost day the 17th of April, a period of 183 days with 112 frost days, and 48 days with a mean temperature not rising above freezing point.

### SPRING.

The mean temperature of the three spring months together is 50.2.

The lowest mean was observed in 1857=43; the highest in 1878=56.6.

The coolest March, 1867=29.5; the coolest April, 1857=39.9; the coolest May, 1867=55; the warmest March, 1878=50.5; the warmest April, 1878=57.9; the warmest May, 1881=71.4.

The mean temperature of the decades are in March 1st=35; 2d=37; 3d=41.8; the lowest was the 1st in 1857=22.3; the highest the 1st in 1878=55.5. April 1, 47.8, 2d, 51.7, 3d, 55.5; the lowest the 1st=32.7; the highest the 3d, 1879=66.2; in May the 1st=59.9, 2d=63.3, 3d=67.9; the lowest the 1st in 1867=51.1; the highest the 3d in 1881, 77.

The highest mean temperature of a single day of March was in 1875, on the 30th=65.6, of April in 1872, on the 29th=77, of May in 1860, on the 24=85.1; the lowest of March in 1867 on the 13th=4.7, of April in 1857 on the 6th=23.7, of May in 1875 on the 1st=39.5.

The highest stand of the thermometer was observed in March, 1860, on the 30th=79; April 1865, on the 26th=88.5; in May 1860, on the 24th=88.5. The lowest in March, 1867, on the 14th=-6; in April 1887, on the 15th=18; in May 1867, on the 8th=30.

There are, in average, 18 frost days in March; 5 in April, and, in May, 5 were observed in 30 years. The most frost days we had were in March 1859=29; and in April 1857=18. There was no frost day observed in April 1878; only 13 p. c. of the frost days of April occurred after the 17th, at which date, for the last time, a mean temperature below freezing point was observed.

### SUMMER.

The mean temperature of the three summer months is 75.5.

The coolest summer was in 1866 and 1869=73; the warmest in 1874=79. The coolest June in 1869=69; the coolest July 1865=71; the cool-

est August 1866=70; the warmest June in 1873=79; the warmest July 1868=82.7; the warmest August 1881=80.5.

The mean temperature of the decades was of June 1st decade=70; 2d=73; 3d=77; of July 1st=77.9; 2d=78.3; 3d=77.2; of August 1st=77; 2d=75.6; 3d=73.3.

The coolest decade of June was the 1st of 1863=63; July the 2d in 1865=65.3; of August the 3d in 1863=65.3; the warmest in June the 3d in 1858=85; in July the 2d in 1878=89.8; in August the 1st in 1861=86.7.

Of the single observations the highest for June was on the 24th, in 1856=100; for July on the 15th, 1859, on the 4th, 1874, and on the 30th, 1885=104; for August on the 31st in 1873=105; the lowest for June on the 4th 1859=35; for July on the 2d, in 1861, and the 16th, in 1863=50; for August on the 29th, in 1863=41.

## FALL.

The mean temperature of the three fall months is 53.3.

The coolest fall was in 1880=48.9; the warmest in 1884=55.1; the coolest September was in 1866=60.5; the warmest in 1865=73.1; the coolest October in 1869=48.2; the warmest in 1879=62.7; the coolest November in 1880=30.2; the warmest in 1867=44.4.

The mean temperature of the decades are the following: For September 1st=70.8; 2d=66.4; 3d=63. For October 1st=59.7; 2d=53.5; 3d 48.5. For November 1st=45.5; 2d=38.8; 3d=33.9.

The coolest decade in September was the 3d in 1856=52.7. The warmest the 1st in 1884=81.3. The coolest in October the 3d in 1869=36.3. The warmest the 1st in 1879=76.3. The coolest in November the 3d in 1880=20.3. The warmest the 1st in 1874=54.5.

The highest stand of the thermometer was observed on the 3d of September, 1864, and on the 5th of September, 1881=98; on the 3d of October, 1856, on the 12th of October, 1879, and on the 8th of October, 1884=90; on the 7th of November, 1874=77. The lowest on the 29th of September, 1871=34; on the 24th of October, 1869=14, and on the 23d of November, 1857=-15.

By comparison of the temperatures of different places in Illinois during the meteorological year, December 1869 to November 1870, we find in the mean temperature of Peoria and Springfield which is nearly a degree farther south, and Ottawa which is more than half a degree farther north, scarcely any difference, but Galesburg farther west and on a higher elevation had, that same year, a mean of one degree lower and a January very much colder. Of the same year the temperatures of Steubenville, Ohio, Fort Madison on the Mississippi, and Nebraska City on the Missouri, all nearly in the same latitude with Peoria, as compared, show the following figures:

	MEAN OF THE YEAR.	IN WINTER.	IN SUMMER.
Steubenville .....	54.5	34.3	75.2
Peoria .....	54.	29.6	76.6
Ft. Madison .....	52.3	27.8	76.6
Nebraska City .....	52.	27.5	74.8

The means of the year are decreasing from east to west; in the same way lower the temperatures of the winter, but the summer is the hottest on the Mississippi and on the Illinois, well considered that Steubenville and Nebraska City be on a greater elevation above the sea-level, and that the climate of Steubenville is influenced by the Canadian lakes.

By a mean period of frost of one hundred and eighty-three days for the season free of frost one hundred and eighty-two days would be left, and so the year would equally be divided; but as the last frost day in thirty years occurred on the 11th of May and the first on the 1st of October, there would be left only one hundred and forty-two days, and even that is good only for the locality of the observations in the midst of the city, for on exposed places in the open country, even in this period, frosts may occur, and, indeed, on the 4th of June, 1859, when the thermometer in the city showed a minimum of 35°, and on the 29th of August, 1863, when the mercury went down to 41°, frosts were reported from the surrounding country. Moreover, the so-called "white frost" may be formed at a temperature of the air above freezing point. All bodies radiate heat, and their temperature lowers, when they do not receive a fresh supply of heat from outside. So do the plants at night time. Radiation takes place in all directions to the surrounding air, and the more so the more clear the sky is and the more calm the air. A small thermometer placed in the grass, on an unprotected place, may very likely show ten or more degrees less than that one that is suspended five feet above the ground. The plants exhale constantly water in gas form, which precipitates upon the cooled surface, and when that cooling reaches the freezing point, white frost is formed.

The difference of temperatures observed in localities of the same latitude shows, that meteorological observations of one locality are good only for that locality, and perhaps its next vicinity, and it is lost labor to compute averages for wider districts f. i. of the State of Illinois, divided by straight lines in a northern, central and southern part, or for even larger area of five or six States, comparing the results with the crops of the same districts so different, not only of temperature and precipitation, but in the nature of the soil. There is no more sense in it than would be in computing the temperature of the whole of North America. It is only waste of time and paper.

The means of the single years range between 8°, the lowest mean temperature of a year was that of 1857=48.7; the highest that of 1878=

56.7. The mean of the first ten years was 52.1, of the second, 51.4, of the last, 52.7.

### TEMPERATURE ACTING UPON PLANTS.

One plant is more sensible than others; cultivated plants introduced from a warmer climate more than indigenous ones, and often in fall the leaves of the tomatoes and dahlias may be killed by a temperature of the atmosphere, which is above freezing point. On the other hand I observed in April 1857, when the gooseberry bushes were green for a week, that the mercury descended to  $19^{\circ}$  without injury to the leaves.

In *Transact. of Ill. Agric. Soc.*, Vol. III, is published a paper read before the Illinois Natural History Society in June, 1859, "On Meteorology in connection with botanical observations," in which I did show that each plant require a certain sum of heat in a certain space of time to perform its physiological functions, and that the degrees below the freezing point, if not destructive, be not reactive, but inactive, and, therefore, all the degrees below freezing point be of no account and excluded from the computation.

In the summer of 1857 I made some observations on the growth of Indian corn. On the 16th of May, two days after a heavy rain, I planted some corn in the yard of my residence, it sprouted on the 25th of May and was ripe on the 30th of September. During these 138 days the sum of daily mean temperature, 5 feet above the ground in the shade, was 3064 c.

The sum of daily mean temperature of the soil four inches below the surface, at 3 P. M., was 3,443; the quantity of rain, 13.2 inches; the mean humidity of the atmosphere, 68 p. c. of saturation. The result of this observation is about the same as that reported by Bousingault upon an observation made at Alais in South France ( $44^{\circ}$  N. L.)

In the above observation, during the period of which the minimum of the temperature was not falling below freezing point, the meteorological observations as made for the Smithsonian Institution, and now for the Signal office, could be used, and the means were computed from the three daily observations at 7 A. M., 2 P. M. and 9 P. M., although this mode of calculation does exclude for the whole summer the minimum (before sunrise) and the maximum (about 3 P. M.); and so the above sum, which would be necessary to ripen Indian corn, was obtained, provided that the temperature of each degree above freezing point have any effect upon its growth.

That, in winter, the temperatures below freezing point are not reactive, can be proved by observations of the periods of blooming of woody plants.

In 1857 spring was tardy, in 1859, very early. Comparing the time of flowering of certain species with the sum of daily mean temperature, commencing with January and excluding all temperatures below freezing point, it is surprising to see the coincidence of figures, and the great difference when the negatives are not excluded. A table published in the

above named transactions, but full of printing errors, and, therefore, herewith corrected, will prove that.

	First Day of Blooming.	SUM OF DAILY MEAN TEMPERATURE (CENTIGRADE),					
		Negatives not excluded	NEGATIVES EXCLUDED.				
			Above freezing.	1 degree above freezing.		2 degrees above freezing.	
Acer Saccharinum . . . . .	May 10, 1857	39.4	526 on 87 days	443 on 86 days	392 on 85 days		
	Apr. 20, 1859	327.4	522 " 88 "	447 " 87 "	377 " 84 "		
Crataegus Subvillosus	May 20, 1857	155.6	642 " 97 "	549 " 96 "	489 " 95 "		
	Apr. 30, 1859	452.4	646 " 98 "	562 " 97 "	483 " 97 "		
Aesculus Glabra	May 20, 1857	155.6	642 " 97 "	549 " 96 "	489 " 95 "		
	Apr. 30, 1859	452.4	646 " 98 "	562 " 97 "	483 " 97 "		
Cerasus Virginiana	May 25, 1857	263	750 " 102 "	652 " 101 "	587 " 100 "		
	May 5, 1859	555	750 " 103 "	661 " 102 "	576 " 102 "		
Asimina Tribola	May 31, 1857	361.2	848 " 108 "	744 " 107 "	672 " 106 "		
	May 10, 1859	657.5	852 " 108 "	758 " 107 "	668 " 107 "		
Robinia Pseudacacia	Jun. 17, 1857	471	978 " 115 "	867 " 114 "	788 " 113 "		
	May 16, 1859	767	962 " 114 "	862 " 113 "	766 " 113 "		

Eleven series were calculated in that way as far as ten degrees above freezing point. As the figures diverge more and more, it seems that the sap of our woody plants moves as soon as the temperature rises above freezing point, for there the figures come nearer together. Only Robinia makes an exception, the starting point of which is probably one degree above freezing point.

This is a Southern tree and at Peoria introduced, but as the observations were made on an individual, standing right near the place of observations, these are the most reliable.

How much later these plants would have been in bloom in the year 1857, when the negative temperatures acted reactive instead of inactive, can be proved by the following table:

	Jan.	Feb.	Mar.	Apr.	May	Jan.—May.	Feb.—May.
1857.							
Sum of daily mean temperature . . . . .	—320	47	27	142	465	361	681
Sum of daily mean above freezing . . . . .	6	106	108	163	465	848	842
Number of days with a temperature above freezing.	4	24	21	28	31	108	104
1859.							
Sum of daily mean temperature . . . . .	—73	26	225	275	615	1068	1141
Sum of daily mean above freezing . . . . .	57	84	226	279	615	1261	1204
Number of days with a temperature above freezing.	19	18	31	30	31	129	110

It may be doubted whether it be advisable to include the temperatures of January.

In continuously cold winters a temperature rising only a few days a few degrees above freezing point, may be inactive; but we have, not rarely, quite warm winter months in which the buds of the trees considerably swell, and, when cold weather follows, rest stationary for a time.

The time of blooming of a number of woody plants were noted, amongst which *Amelanchier canadensis*. From seventeen years an average sum of heat of 450 degrees (centigrade) was found from the 1st of January to the day of blooming, which is in average the 21st of April. In this period of one hundred and eleven days the temperature rises on seventy-eight days above freezing point. The earliest time of blooming was observed in 1871, on the 4th of April, with a sum of 414 degrees; the latest in 1857, on the 8th of May, with a sum of 496 degrees. The difference of 82 degrees may be accounted for, when we consider that the heat is not the only agent. The time of blooming may partly depend on the moisture in the ground, the dryness of the atmosphere, and, before all, on the quantity of light and direct insolation.

The above figures indicate not the absolute, but the relative value of heat, i. e.: When the sum of daily means above freezing point reaches 450 degrees in the shade, then the *Amelanchier* is in flower, or is in flower since several days, when we had much sunshine and the air is dry, or will be in flower in a few days, when we had less sunshine and the air is moist.

Of fifteen other species, the necessary heat and the time of blooming was calculated.

	MEANTIME OF BLOOMING.	SUM OF HEAT IN CENTIGRADE DEGREES.	NUMBER OF OBSERVA- TIONS.
<i>Acer dasycarpum</i> .....	March 27th.	210	11
<i>Ulmus americana</i> .....	March 31st.	230	13
<i>Negundo aceroides</i> .....	April 21st.	440	7
<i>Acer saccharinum</i> .....	April 28th.	530	12
<i>Prunus americana</i> .....	April 29th.	550	6
<i>Cercis canadensis</i> .....	May 3d.	600	12
<i>Aesculus glabra</i> .....	May 6th.	650	15
<i>Pyrus coronaria</i> .....	May 11th.	740	5
<i>Morus rubra</i> .....	May 13th.	760	5
<i>Prunus virginiana</i> .....	May 13th.	770	7
<i>Asimina triloba</i> .....	May 15th.	800	7
<i>Prunus serotina</i> .....	May 22d.	920	5
<i>Robinia pseudacacia</i> .....	May 23d.	940	15
<i>Catalpa speciosa</i> .....	June 7th.	1270	6
<i>Tilia americana</i> .....	June 26th.	1700	11

That the temperature of December is not of great influence, as one might suppose, shows the December, 1877, with a sum of 225 degrees above freezing point. The American Elm was in bloom on the 8th of March, 1878, with a sum of 235 starting from the 1st of January, and the same on the 10th April, 1866, with a sum of 240. The December, 1865,

had only a sum of 40 degrees. So the elm must either be in bloom on the 4th of February, when the sum of heat was 280 degrees, or required, in 1878, a sum of 460 against 280 in 1886. Amelanchier was in bloom in 1878 on the 27th of March, with a sum 454 degrees, and in 1861, on the 11th of April, with 453 degrees. December, 1860, had only a sum of 27 degrees: accordingly, Amelanchier required 679 degrees in 1878, and only 480 in 1861, or the due time of blooming was in 1878, the 8th of March.

## BAROMETER.

The observations on the pressure of the atmosphere comprise twenty-five years from December, 1860, to November, 1885.

The mean reduced to freezing point was 29.628 inches; the mean, at 7 A. M., is 29.644; at 2 P. M., 29.606; at 9 P. M., 29.634. The highest stand was observed in January, 1866, 30,671, and the minimum in April, 1880, 28,581, the range being 2.090.

The greatest range in one month was observed in January, 1866, 1.676; the smallest in August, 1878, 0.283. The highest mean of a month had, December, 29.698; the lowest May, 29.548.

The greatest range in twenty-four hours was observed in January, 1.028. In July it is only 0.389.

There are generally two oscillations in twenty-four hours, with two minima at 11 A. M. and 10 P. M., and two maxima at 4 A. M. and 4 P. M. The rise and falling is, in the tropic countries so regular, that it is possible to determine the daytime from the stand of the barometer; in our zone it is more variable, so that often a continuous falling or rising for several days is observed.

TABLE 4.  
BAROMETER REDUCED TO FREEZING POINT.

DECEMBER 1860—1885.

	7 A. M.	2 P. M.	9 P. M.	Mean.	Maxi- mum.	Mini- mum.	Range.	Greatest change in 24 hours.
December .....	29.714	29.680	29.717	29.704	30.389	28.771	1.618	1.017
January .....	29.724	29.685	29.726	29.712	30.671	28.795	1.876	1.028
February .....	29.688	29.649	29.683	29.673	30.453	28.823	1.630	0.967
March .....	29.632	29.600	29.632	29.621	30.364	28.612	1.752	0.950
April .....	29.572	29.540	29.568	29.560	30.252	28.581	1.671	0.811
May .....	29.571	29.532	29.554	29.552	30.041	28.670	1.371	0.750
June .....	29.583	29.546	29.565	29.565	29.956	28.996	0.960	0.508
July .....	29.607	29.572	29.587	29.589	29.944	29.134	0.810	0.484
August .....	29.608	29.572	29.590	29.591	29.965	29.207	0.758	0.492
September .....	29.670	29.626	29.651	29.648	30.083	29.051	1.031	0.617
October .....	29.677	29.629	29.664	29.657	30.254	29.025	1.229	0.718
November .....	29.679	29.637	29.678	29.664	30.308	28.725	1.583	0.838
Year .....	29.644	29.606	29.634	29.628	30.671	28.581	2.090	1.028



## PRECIPITATION.

The mean quantity of rain and melted snow was 35.6 inches per year in one hundred rainy days. The smallest quantity falls in January, 1.6 in seven days; the greatest in June and July, each with four inches in ten and nine days. The precipitation in winter is 6.1, in spring 9.7, in summer 11.2, in fall 8.6. This would be favorable when distributed in that way every year; but the single years differ very much. In 1856 it was only 22.8; in 1858, 51.4. There are sometimes long droughts. From the 29th of August to the 8th of October, 1871, there was only one rainy day in the middle of September with 0.65 of an inch of rain. The longest period without any rain was in 1861, in October and November, which lasted twenty-eight days. There was one in the spring of 1863 of twenty-one days, in April and May, 1863, of twenty days; in July, 1873, of nineteen days, and the same in July and August, 1869. Sometimes there are long periods of too much rain, f. e. in 1858, from the 29th of April to the 10th of June, 15.7 inches in twenty-seven rainy days.

The quantity of rain is of less importance than the number of rainy days and their distribution. The highest number for one month was 18 in May, 1858, and in July, 1865, the lowest in September, 1871, and February, 1877, each with one rainy day.

Supposing that eleven inches of rain in twenty-six days of the three summer months be most beneficial, and that a plus or minus of two inches and two rainy days be of no importance, than we had in the summers of 1862, 1869 and 1872, a great excess in quantity, viz: 9.1, 7.8 and 10.8 inches surplus, and an excess in the number of rainy days in 1865 and 1866, viz: thirteen, and seven surplus. A deficiency in quantity show the years 1870, 1868 and 1865 with 6.6, 5.8 and 5.6 minus, and in rainy days, 1863 and 1856, viz: twelve, and eight minus.

The most normal summers (in regard of rain) were 1857 and 1871.

The greatest quantity of rain for one month was measured in May, 1858, 10.64; then in June, 1872, 9.76, and in September, 1875, 9.61.

The mean precipitation of the single months are: December, 2.5; January, 1.6; February, 2; March, 2.7; April, 3.2; May, 3.8; June, 4; July, 4; August, 3.2; September, 3.5; October, 2.7 and November, 2.4.

## HUMIDITY OF THE ATMOSPHERE.

The relative humidity of the air was computed from the difference of the wet and dry thermometer by means of Guyot's tables. When there is no difference the atmosphere is saturated with moisture, and that is noted by 100. The greater the difference the lower is the per centage; 20 means very dry, and there is scarcely ever noted a lower figure.

The mean of the year is at 7 A. M., 81; at 2 P. M., 58; at 9 P. M., 75. The highest mean in January at 7 A. M., is 89; the lowest in May, 2 P. M., 50.

The pressure of vapor is the highest in July, 9 P. M., 0.669 of an inch, the lowest in January, 7 A. M., 0.114.

The means for the year are: 0.316 at 7 A. M.; 0.338 at 2 P. M., and 0.340 at 9 P. M.

TABLE 5.  
PRECIPITATION, HUMIDITY OF ATMOSPHERE, AND  
PRESSURE OF VAPOR.

	MEAN PRECIPITATION*		RELATIVE HUMIDITY OF THE ATMOSPHERE.			PRESSURE OF VAPOR IN FRACTIONS OF INCHES.		
	In Inches	In days	7 A.M.	2 P.M.	9 P.M.	7 A.M.	2 P.M.	9 P.M.
December .....	2.48	8	87	70	80	.130	.142	.134
January .....	1.61	7	89	71	81	.114	.130	.122
February .....	2.04	8	87	66	80	.122	.145	.138
March .....	2.68	9	80	59	74	.157	.185	.177
April .....	3.17	10	75	52	70	.240	.260	.263
May .....	3.80	10	73	50	70	.362	.390	.397
June .....	4.03	10	77	53	74	.537	.559	.567
July .....	4.04	9	78	53	74	.626	.642	.669
August .....	3.16	7	81	52	75	.590	.610	.642
September .....	3.49	8	83	55	76	.465	.500	.492
October .....	2.71	7	83	55	75	.276	.299	.291
November .....	2.37	7	81	63	75	.173	.193	.185
Winter .....	6.13	23	88	69	80	.122	.139	.131
Spring .....	9.65	29	76	54	71	.253	.278	.279
Summer .....	11.23	26	79	53	74	.548	.604	.626
Fall .....	8.57	23	82	58	75	.305	.331	.323
Year .....	35.58	100	81	58	75	.316	.338	.340

## CLOUDINESS AND SUNSHINE.

The cloudiness of the sky is expressed by figures, which mean the percentage of covering, 100 was noted, when the sky was entirely covered, 50 when half, and so on, and 0 when cloudless. The sky is the most covered in December in the morning, and least in August in the evening.

The mean for the year is 47; the highest for the month is in December, 55; the lowest August, 35.

From the amount of cloudiness cannot be deduced the time of sunshine during a period, for the sky may be half covered, the sun may shine during the whole day. It is necessary to note the time of sunshine every day. This was done from December 1857 to November 1868 and the result was that we had sunshine 58 p. c. of the time from sunrise to sunset.

The sunniest months are June and August each with 71 p. c.

How great the influence of insolation must be upon the growth of plants is shown by the difference of the thermometer in the shade and exposed to the sun, which, in June, often exceeds 20 degrees and more yet in winter.

	PER CENT. OF COVERING.				NUMBER OF DAYS				SUNSHINE.	
	7 A.M.	2 P.M.	9 P.M.	Mean.	Cloud- less.	Moder- ately cloudy.	Very cloudy.	With- out sun shine.	Hours.	per ct.
December ....	59	54	53	55	4	10	17	10	129	45
January .....	57	56	48	54	4	10	17	9	133	46
February .....	52	55	49	52	3	11	14	7	149	51
March .....	53	56	49	52	3	12	16	6	182	50
April .....	51	57	45	51	2	11	16	5	192	49
May .....	45	50	35	43	3	13	15	3	269	61
June .....	44	48	32	41	2	16	12	1	315	71
July .....	37	47	29	38	2	18	11	1	314	69
August .....	37	45	27	35	4	18	10	1	299	71
September ....	44	45	31	40	4	14	12	2	216	58
October.....	47	46	35	43	6	12	13	5	202	59
November ....	55	56	49	53	3	10	17	9	148	51
Winter .....	56	55	50	54	11	31	48	26	411	48
Spring .....	49	54	43	49	8	37	47	14	643	53
Summer .....	39	47	29	38	7	52	33	3	929	70
Fall.....	48	49	39	45	13	36	42	16	566	56
Year.....	48	51	40	47	39	156	170	59	2550	58

## WIND.

West winds are prevalent from October to April. South winds during the summer; only in August east equals the south. About 12 p. m. of all the observations are marked as high winds, gales or hurricanes, but the force of winds were not measured by the anemometer but only estimated, and the dates are not quite reliable.

The windiest months are March and April; the calmest, August and September.

Wind and temperature, wind and cloudiness, wind and precipitation are, in a certain degree, correlative. The warmest winds are south, southwest and east; the coldest, northwest, north and northeast. The difference between the coldest and warmest winds is about 15, in spring even 20 degrees. Above the average is the temperature with south and southwest in all the months, with east only in spring and fall. Southeast wind is too scarce, so that no reliable mean could be abstracted. The temperature of north is always below. Northeast is only in November, December and January above, and that may be accounted for by the great quantity of cloudiness that always accompanies these winds, preventing radiation. Northwest has only, in August, a temperature above average. The region from which this wind come is naturally a cold one, only during the sum-

mer months excessive heat is accumulating, what has the above effect upon these winds. The same reason is good for the west during all the summer months: in the rest the west winds are cooler.

Northeast brings the most cloudiness, and west the least; the west is the only one that has a cloudiness considerably below average.

The relation of wind and precipitation must be considered in a double way. When we compute the direction of wind in 1,000 observations of precipitation, then we find that we have 258 times south wind; 174 times east; 159 times northeast; 105 times southwest; 95 times west; 84 northwest; 79 north, and 46 times southeast. But when we reduce the observations of precipitation to 1,000 of each wind direction, then we find for each wind the following per mille. of rain observations: northeast, 317; southwest, 153; southwest, 132; south, 126; northwest, 124; east, 111; north, 93; west, 46. That shows that northeast is the prevalent rain wind. But the single months differ. In summer southwest brings the most rain, and nearly all the thunder storms come from southwest or northwest. The average number in a year is twenty-eight.

TABLE 7.

DIRECTION OF WIND FROM DECEMBER, 1855, TO NOVEMBER, 1885.

REDUCED TO 1000.

	West.	South West.	South	South East.	East.	North East.	North.	North West.
December .....	280	96	207	43	136	56	78	104
January .....	308	103	216	25	110	47	87	104
February .....	290	57	217	32	149	57	113	85
March .....	259	62	188	38	167	64	114	108
April .....	214	70	208	28	197	78	117	88
May .....	184	67	244	43	235	66	111	50
June .....	209	84	302	39	222	39	63	42
July .....	193	97	253	55	220	60	89	53
August .....	188	84	239	30	248	61	92	58
September .....	160	74	279	36	211	52	126	62
October .....	233	82	240	32	157	66	111	79
November .....	293	69	233	37	137	53	83	95
Winter .....	293	86	214	33	131	53	92	98
Spring .....	217	67	214	37	200	69	114	82
Summer .....	197	88	264	34	239	54	82	51
Fall .....	229	75	250	35	168	57	107	79
Year .....	233	79	235	35	183	58	99	78

TABLE 8.

NUMBER OF OBSERVATIONS OF STRONG WINDS MORE THAN  
TWENTY-FIVE MILES AN HOUR.

DECEMBER, 1855 TO NOVEMBER, 1885.

ONE PER CENT. OF ALL OBSERVATIONS (32,765).

	West.	South West.	South.	South East.	East.	North East.	North	North West.
December .....	14	3	.....	.....	3	.....	.....	2
January .....	14	2	.....	.....	1	.....	.....	2
February .....	26	5	5	1	3	.....	.....	4
March .....	25	10	9	1	3	8	1	2
April .....	23	13	9	.....	3	4	.....	3
May .....	12	7	4	2	.....	2	2	1
June .....	8	5	2	.....	.....	2	.....	.....
July .....	8	4	2	.....	.....	.....	1	4
August .....	.....	.....	2	.....	.....	.....	.....	1
September .....	3	1	6	.....	.....	.....	1	.....
October .....	11	8	8	1	.....	2	.....	2
November .....	17	2	6	3	.....	2	.....	1
Winter .....	54	10	5	1	7	1	.....	8
Spring .....	60	30	22	3	6	14	3	6
Summer .....	16	9	6	.....	.....	2	1	5
Fall .....	31	11	20	4	.....	4	1	11
Fall .....	161	60	54	8	13	20	5	22

TABLE 9.

## MEAN TEMPERATURE COINCIDENT WITH CERTAIN WINDS.

DECEMBER, 1865 TO NOVEMBER, 1885.

	West.	South West.	South.	South East.	East.	North East.	North.	North West.
December .....	22.2	30.8	35.4	34.3	29.8	32.2	25.5	25.3
January .....	16.6	29.6	32.3	29.9	24.9	25	21.9	21.7
February .....	22.7	33.6	37.5	28.6	29.8	28.1	22.5	23.6
March .....	34.4	43.4	45.5	49.6	36.5	34.9	32.6	33.3
April .....	50.4	64	60.1	58.2	50.3	43.1	47.4	45.2
May .....	59.4	75.5	72.4	72.1	63.4	56.3	60	57.1
June .....	72.7	78.8	76.7	73.5	72.4	67	71	67
July .....	79.5	82.5	81.9	78.5	77	71.4	73.8	75.9
August .....	76.5	79.9	79.9	78	74.4	70.2	69.6	74.9
September .....	66	78.5	72.1	67.8	66.5	63.1	63.7	61.9
October .....	49.7	59.4	60.8	57.5	55.7	56	47.5	48
November .....	34.2	42.9	45.9	43.1	42.7	40.1	35.1	34.9
Winter .....	20.3	30.9	35	31.4	28.2	28.7	23.2	23.6
Spring .....	46.9	61.5	60.5	59	51.6	44.3	46.1	42.3
Summer .....	76.3	80.7	79.3	77	74.9	69.2	71.4	72.8
Fall .....	46.9	61.1	60	55.3	56.6	53	50.9	46.2
Year .....	45.4	60.1	59.5	55.8	55.8	46.6	47.3	42.2

TABLE 10.  
WIND AND CLOUDINESS.  
PERCENTAGE OF COVERING.

	West.	South West.	South.	South East.	East.	North West.	North.	North West.
December .....	35	50	61	72	72	88	61	70
January .....	31	48	59	66	71	90	63	71
February .....	33	54	55	53	61	93	61	56
March .....	31	52	57	60	60	87	56	62
April .....	38	48	51	51	52	81	52	56
May .....	32	51	42	55	40	70	44	60
June .....	30	55	38	45	40	61	42	55
July .....	30	45	37	35	37	56	37	37
August .....	28	42	35	36	30	65	39	45
September .....	30	42	37	33	35	78	38	51
October .....	31	36	42	60	37	80	43	65
November .....	38	49	54	66	44	90	55	72
Winter .....	33	50	58	64	68	90	62	67
Spring .....	33	50	50	55	50	71	51	60
Summer .....	29	47	37	39	35	61	38	46
Fall .....	34	42	44	52	44	82	44	64
Year .....	32	47	47	52	47	79	50	61

TABLE 11.  
DIRECTION OF WIND IN ONE THOUSAND OBSERVATIONS  
OF PRECIPITATION.

	West.	South West.	South.	South East.	East.	North East.	North.	North West.
December .....	81	89	231	61	190	170	78	100
January .....	37	66	288	18	188	162	100	140
February .....	71	55	219	32	178	216	139	90
March .....	84	84	228	49	162	192	106	95
April .....	98	75	191	44	228	191	98	75
May .....	85	115	272	51	203	141	82	51
June .....	110	186	318	56	161	79	31	59
July .....	147	179	244	38	172	103	55	62
August .....	106	159	237	21	163	155	65	94
September .....	111	88	306	24	182	138	84	67
October .....	93	100	270	60	117	194	83	83
November .....	107	55	287	87	142	180	42	100
Winter .....	65	71	244	39	185	183	104	109
Spring .....	89	92	231	48	197	174	95	74
Summer .....	121	177	272	39	166	107	48	70
Fall .....	104	81	288	56	147	170	70	84
Year .....	95	105	258	46	174	159	79	84

TABLE 12.  
OBSERVATIONS OF PRECIPITATION REDUCED TO ONE  
THOUSAND FOR EACH WIND.

	West.	South West.	South.	South East.	East.	North West.	North.	North West.
December .....	37	120	143	185	180	391	128	123
January .....	11	62	129	73	167	333	111	130
February .....	30	117	123	119	146	465	148	130
March .....	43	169	160	165	128	392	123	115
April .....	58	138	117	202	148	312	108	109
May .....	62	230	150	158	115	289	100	136
June .....	69	294	138	172	95	269	64	194
July .....	80	193	100	114	81	179	64	121
August .....	49	171	87	62	57	221	61	143
September .....	76	129	121	72	94	288	63	120
October .....	43	132	121	202	79	318	74	113
November .....	39	85	132	255	111	361	80	112
Winter .....	26	95	132	136	164	398	130	126
Spring .....	54	179	142	171	130	330	110	117
Summer .....	66	216	110	128	77	216	63	147
Fall .....	49	117	128	176	94	322	71	114
Year .....	46	132	126	153	111	317	93	124

## VEGETATION.

The floral district of the upper Mississippi, as I understand it, will comprise the southern part of Wisconsin from about the  $44^{\circ}$  N. L. Minnesota, from  $46^{\circ}$  N. L. southward, the greater southeastern part of Iowa the wooded eastern borders of Nebraska and Kansas. Missouri, northwestern Arkansas with the eastern borders of Indian Territory, and, finally, Illinois — except the southern and southeastern borders along the Ohio and lower Wabash (Ohio flora). There may be added the prairie land of northwest Indiana, but the shores of Michigan Lake all around, should be excluded as a part of the Canada flora. The western line of this district would nearly coincide with the limits of the palaeozoic formation on the east, and the new red sandstone on the west side; but, as already said, it is difficult to circumscribe a floral district by lines. Many western species cross the Missouri into Iowa, and not a few the Mississippi into the Illinois country and are found in the numerous and often extensive prairies between the woodland. Therefore, the vegetation of the upper Mississippi should be regarded a gradual transition between the woodland-flora of the Ohio district and the prairie-flora of the western plains.

There are good reasons to exclude that part of the State of Illinois that is south of the dividing ridge crossing from the Wabash to the Mississippi, with an elevation of about 150 meter above the country both sides. There are no prairies in this district of tertiary formation, and the common forest trees are such that do not occur north of the dividing ridge, or only rarely, and not far northward, but all are common on the Ohio

upward, and the same may be said of a number of monocarpic and rhizocarpic species.

Flora Peoriana shall be called that complex of species and varieties of plants that occur around the city of Peoria within a radius of 10 or 12 miles. About 80 per cent. of this area was originally covered by woods, original prairie was little, and there is nearly none now.

## THE FOREST.

Generally the forest is mixed of many species, although some are sociable but never excluding others f. i. the white oak and the hickories, with the hazel as undergrowth in the upland, and the willows and cotton wood in the bottoms.

The whole number of woody plants included, the small shrubs is 112 in 58 genera and 30 orders: Ranunculaceæ, 1; Anonaceæ, 1; Menispermaceæ, 1; Tiliaceæ, 1; Anacardiaceæ, 3; Rutaceæ, 2; Vitaceæ, 4; Rhamnaceæ, 3; Celastraceæ, 2; Sapindaceæ, 5; Leguminosæ, 4; Rosaceæ, 15; Saxifragaceæ, 3; Hamameliaceæ, 1; Cornaceæ, 6; Caprifoliaceæ, 6; Rubiaceæ, 1; Ericaceæ, 3; Ebenaceæ, 1; Bignoniaceæ, 1; Oleaceæ, 5; Lauraceæ, 1; Thymelaceæ, 1; Urticaceæ, 4; Platanaceæ, 1; Juglandaceæ, 8; Cupuliferæ, 12; Salicaceæ, 13; Coniferæ, 2; Smilaceæ, 1.

The biggest trees are the white elm, the sycamore, the cottonwood, the soft maple, the white oak and the swamp white oak. They attain often a diameter of 15 decimeter; then follow with an average thickness of 13 decimeter, the scarlet, red and burr oak, the sugar maple, the black walnut, the two shell-bark hickories, the pignut and mockernut, the basswood, the box elder, the honey locust and the hackberry; of 6 to 9 decimeter; the five species of ash, the slippery elm, the butternut, the pecan, the bitternut, the shingle and chestnut oak, the coffeenut, the wild cherry; a thickness of 3 to 6 decimeter attain the mulberry, buckeye, sassafras, the American and large-toothed aspen, black willow and the red cedar.

Small trees are the persimmon, service berry, red bud, paw paw, hornbeam, hop hornbeam, crabapple, sheep berry, plum, buckthorn, hop tree and the haw thorn.

Large shrubs often of tree form with stems 1 decimeter thick are the following: witch hazel, wahoo, prickly ash, bladdernut, long-leaved willow, smooth sumach, the silky, paniced and alternate-leaved cornel, the black haw. Large shrubs are the hazelnut, the false indigo, chokecherry, elder, button bush, rough-leaved and red osier dog wood, arrow wood, aromatic sumach, the silky and glaucous willows.

Very small shrubs are three species of roses: the New Jersey tea, currant and gooseberry; leather wood, the hoary, prairie, dwarf and myrtle willows; black huckleberry, low blueberry, bearberry, wild hydrangea and the alder-leaved buckthorn.



Woody climbers are the trumpet creeper, the Virginia creeper, the poison ivy, the Virgin's bower. 3 species of grapevines, the yellow honey suckle, the waxwork, the climbing rose, the hispid green brier and the Canadian moonseed.

As much mixed as the forest is, the different species of trees and shrubs do not like the same localities. Some prefer a dry, others a moist soil.

The left bank of the Illinois river opposite Peoria is bottom land one mile wide, in spring inundated and for the greater part still thickly wooded. Nearest the bank we find the long-leaved and the black willow, cotton wood, sycamore, soft maple and white elm. Farther backward, black walnut, butternut, pecan, ribbed hickory, hackberry, slippery elm, burr oak, swamp white oak, the five species of ash, of which the green ash is the most frequent, the coffee nut, the honey locust, mulberry, box elder, the buckeye, the paw paw, the persimmon, the elder and the false indigo. On open swampy places, the button bush, the osier dogwood and species of shrubby willows.

The highest trees climb the grapevine, the poison ivy, the Virginian creeper and the trumpet creeper: on shrubs, the climbing rose and the hispid green brier.

Along the foot of the bluff and upward the forest is composed of sugar maple, scarlet, red and shingle oak, chestnut oak, wild cherry, large toothed and American aspen, hop tree, service berry, bass wood, hornbeam, hop-hornbeam, sheeps berry. The undergrowth is composed of witch hazel, wahoo, prickly ash, bladdernut, buckthorn, arrow wood, chokecherry, rough-leaved dog wood, panicled and alternate-leaved cornel, yellow honey suckle and wax work.

On the upland the prominent trees are the white oak, shell-bark hickory, mockernut, bitternut. The brushes hazel, New Jersey tea, smooth sumach and prairie willow.

Coniferous trees are rare: red cedar on single places in small groups and of small growth. The arbor vitæ seems to be extinct, but no doubt was once indigenous, for 30 years ago a single tree 60 centimeter thick was found in a swampy place, where it was certainly not planted. The trunk was inclined in an angle of 35 degrees from the ground, so that one could walk up to the branches.

Some of the larger trees grow very rapidly, f. i. cottonwood and sycamore, others have slow growth. A white oak, 11 decimeter thick, was examined, and 250 circles could be counted, 25 of them occupying the sapwood. A sugar maple 92 centimeter thick had 230 circles, and the growth of the last 100 years was only 2 decimeter. The outermost layer of the bark was 125 years old, and the width of the bark was 3 centimeter. A black walnut 75 years old was 3 decimeter thick — a thickness attained by cottonwood already in 20 years.\*

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\*The biggest tree I measured was a bald cypress, in Pulaski county. It had in 4 feet from the ground a diameter of 2.1 meter.

Trunks, branchless to a great height, are not rarely found of cotton wood and sycamore, and then the crown has a table form, although the first growth is pyramid-shaped. The coffeenut tree, the ash, the pecan, the sassafras and the wild cherry have a slender trunk. A wide spreading dome-shaped crown have the box elder, the elm, the basswood, the sugar maple and the honey locust, which is conspicuous by its slender horizontal branches. Few branches only have the walnut, butternut, hickories and the coffeenut. Very irregular and knotted-branched is the white oak; densely-branched the elm, hackberries and the shingle oak.

The form of the leaves is manifold: 13 species have lobed leaves: all the oak (except the shingle oak and the chestnut oak, which is only toothed), the maples, sycamore, etc. The leaves of a number are deeply divided or palmate as the buckeye, and not less than 22 species, of which 16 large trees have pinnately divided leaves: the ash, hickories, walnut, butternut, coffeenut and honey locust. The last often very large trees with long branches and double pinnate leaves and small leaflets, represent strength joined with elegance.

The forest is adorned by various tints, changing with the seasons. In March, wherever the elm is predominant, it appears reddish brown, for the white elm (and the soft maple) is the first in bloom. Then follow the male trees of cotton wood with dark-red catkins. In April, the plum and serviceberry with white, the red bud with peach red, and the sugar maple with yellow blossoms. All these develop the flower before leafing. The first young green in April show the buckeyes, and soon afterwards the upright yellow bunches of flowers open in the last days of April or the first week in May. About the 10th of May the forest is green all over; only the sycamore extends the whitish branches leaflets, for that is the last of all the trees that does develop the leaves.

Most of the other trees and shrubs are in bloom during the rest of May. The latest are in middle June the coffeenut, and at the end of June or in the first days of July the basswood, and, finally, the witch hazel opening the flowers only in November, when the leaves are withered and fallen and the fruits of the last year elastically disperse their seeds. Some of the conspicuously blooming shrubs and climbers adorn the woods and copses in July: the elder, the climbing rose, the Virgins bower and the trumpet creeper.

In the fall the forest is shaded of manifold tints by changing the green of the leaves into deep red (*Rhus glabra* and *Ampelopsis*) light red (*Quercus rubra* and *coicinea*) orange, (sugar maple) yellow, (*Prunus serotina* and *Amelanchier*) and brown of every shade (*Platanus* and many others). The hickories are the first that shed the leaves: often already at the end of August. In the latter part of October most of the trees are leafless. Only the white oak and the shingle oak keep partly the dry leaves all winter.

The forest is rich in herbaceous plants (about 250), many of them with conspicuous flowers of vivid colors. The first in flower are *Hepatica* and *Trillium nivale*, mostly in the middle of March, and the last in fall are most of the compositæ, species of *Aster*, *Solidago*, *Helianthus*, *Eupatorium*, *Helenium*, etc.

## THE PRAIRIE.

The largest prairie of the district in question does not exist any more. It was where now the city of Peoria is built, and the little that is left is no more a prairie, for most of the prairie plants are replaced by immigrated foreign weeds. The smaller prairies of the district are turned mostly into cultivated land; still most of the prairie plants that occur in Illinois are represented.

How originated the prairie? To solve this problem many attempts were made. Violent storms were accused to prevent the growth of trees. But the wooded districts are exposed to the same violent storms that prostrate the largest trees but never the young pliant stems, which will grow when the older ones are gone.

There is a general belief that the annual prairie fires make the prairie; a view which without hesitation even Volney adopted in his "Tableau du climat et du sol des Etats unies" ("ou la nature du sol et *plus encore* les incendies anciens et annuel des sauvages ont *occasioné* de vastes deserts"). A burnt forest will not be turned to a prairie, for at once brambles and other shrubs grow up and defend the forest soil against the invasion of the prairie, and we find no remnant stumps below the sod what would prove that there was once a forest.

Prevailing dry winds and deficiency of rain may be the cause of treeless tracts in southern Russia, but certainly not in the upper Mississippi valley with an annual average of 35 inches of precipitation with about one hundred rainy days. To explain the origin and existence of the prairies we have to resort to geological causes.

Lesquereux, in Geological Survey of Illinois (I., 238-254), demonstrates that the soil of the prairie was formed under water by slow decomposition of water plants. When the land emerged it was first swamp, then wet prairie, at last dry prairie with a compact sod of grasses; the soil had such physical and chemical qualities that no tree could grow. To make trees grow it is necessary to plow deep and to expose the soil, so rich of ulmic acid, to the atmosphere. Bushels of tree seeds may be thrown on the surface of the prairie, they will not germinate; or even if they germinate the roots will not penetrate the sod.

Of all the theories this is one of the most acceptable. But there are often small prairies in the midst of forests that have a quite different origin. They are the result of the work of the beaver that build a dam

across a brook; ponds were formed, the trees died when such that could not exist in water; afterwards, when the beaver was gone, by and by the dam broke, the water flew off and grasses formed a meadow. Such forest meadows may sooner or later turn again into forest and have nothing in common with the true prairies.

In the upper Mississippi district forest and prairie struggled for existence before culture ended that struggle by subdoing both to the plow. Now the trees are planted on the cultivated prairie land, and so, although regardlessly wasted even in localities fit only for tree growth, the forest got the advantage over the prairie. But even before, when forest and prairie were in their natural state, the trees gained ground at the cost of the prairies. When we examine the constituent parts of the western woods, we find that they gradually diminishing in species follow the large river vallies and even along the small tributaries; then we conclude that all those species from their eastern home traveled westward. The fittest to travel and to settle: the cottonwood, the sycamore and the hackberry, the elm spread the farthest towards the Rocky Mountains, others not farther than Missouri and Iowa, or did not pass over the Mississippi. Not the woods, as was believed, yielded to the prairie, but, on the contrary, the prairie yielded to the woods.

When in the course of time the wide level plain was furrowed by streaming water, from year to year hollowed banks sank down, deep vallies were formed, flanked with steep bluffs once the banks of the rivers, then sod and argillaceous underground and humus thoroughly mixed, as to-day by the plow on the prairie, formed a soil fit to receive the spreading forest growth, and species after species could migrate to the far west.

As the woody plants did westward, so the prairie plants wandered eastward, diminishing by and by in number. Of 55 species of the prairie-flora, that under the same latitude don't go beyond the Alleghanies, 23 do not reach the State of Ohio, and Iowa has many western species that eastward do not cross the Mississippi.

We distinguish wet and dry prairie. The former in the river bottoms or in depressions of the dry prairies which occupy the high and undulating plain.

The number of species of our prairie plants is scarcely more than 200, and many of them are not restricted to the prairie. The first in spring blooming on the dry prairie are: *Draba caroliniana*, *Anemone decapetala*, *Ranunculus fascicularis*, *Oxalis violacea*, *Androsace occidentalis*. Then follow in May, *Lithospermum angustifolium*,\* *canescens* and *hirtum*, *Troximon cuspidatum*, *Baptisia leucophæa*, *Pentstemon pubescens*; in June, *Viola delphinifolia*, *Scutellaria parvula*, *Linum sulcatum*, *Polygala incarnata* and *sanguinea*, *Asclepias Meadii* and *obtusifolia*, *Sisyrinchium Bermudiana*, *Tradescantia virginica*, *Cirsium pumilum*, *Silene Antirrhina*,

\**Lithospermum longiflorum* Spreng. is the same as *L. angustifolium* Mich. and was founded on specimens with earlier and larger flowers.

*Cacalia tuberosa*; in July, *Silphium laciniatum*, *terebinthinaceum* and *integrifolium*, *Echinacea angustifolia*, *Coreopsis palmata* and *lanceolata*, *Rudbeckia hirta* and *subtomentosa*, *Lepachys pinnata*, *Asclepias tuberosa* and *verticillata*, *Euphorbia corollata*, *Petalostemon violaceum* and *candidum*, *Amorpha canescens*, *Desmodium Illinoense*, *Ruellia ciliosa*, *Callirhoe triangulata*, *Potentilla arguta* and *Eryngium yuccæfolium*; in August, *Helianthus rigidus* and *occidentalis*, *Solidago rigida* and *missouriensis*, *Hieracium longipilum*, *Diplœappus liniifolius*, *Liatris cylindracea*, *scariosa* and *pynostachya*, *Prenanthes aspera*, *Gnaphalium polycephalum*, *Chrysopsis villosa*; lastly in September, *Aster sericeus*, *azureus*, *oblongifolius*, *multiflorus* and *ericoides* and *Gentiana puberula*. Number, size and color make these most characteristic members of the prairie flora conspicuous; besides ought to be mentioned a number of tall gregarious grasses: *Chrysopogon nutans*, *Andropogon furcatus* and *scoparius*, *Kœleria cristata*, *Eatonia obtusata*, *Elymus canadensis* *Stipa spartea* and *Sporobolus heterolepis*.

The flora of the wet prairies is mixed with the species of the neighboring banks, swamps and bottom-wood and differs according to the soil (sand or silt). The most conspicuous species are in spring: *Menyanthes trifoliata*, *Scilla Fraseri*, *Allium canadense*; in summer, *Spiræa lobata*, *Phlox glaberrima*, *Asclepias Sullivantii*, *Sagifraga pennsylvanica*, *Phaseolus diversifolius*, *Steironema longifolia* and *lanceolata*, *Ipomoea lacunosa*, *Habenaria leucophæa*; in fall, *Boltonia asteroides* (*glastifolia*) *Prenanthes racemosa*, *Solidago neglecta*, *Riddellii* and *ohioensis*, *Helianthus giganteus* *Gentiana Andrewsii* and *Polygonum ramosissimum* — the latter often six feet high. Besides there are many Cyperacæ: *Scirpus lineatus* and *atrovirens*, *Cyperus erythrorhizus*, *Michauxianus* and *strigosus*, *Carex vulpinoidea*, *crus corvi*, *stipata*, *conjuncta*, *arida*, *scoparia*, *straminea*, *cristata*, *hystriœina*, *tentaculata* and some tall grasses: *Calamagrostis canadensis*, *Leersia lenticularis* and *Spartina cynosuroides*.

## WATER, SWAMP AND MOIST PLACES.

From the foot of the eastern bluffs numerous springs rush in small beds toward the lower bottom land or form swampy places of little extension. There we find *Caltha palustris*, *Cardamine rhomboidea*, *Parnassia caroliniana*, *Archangelica atropurpurea*, *Aster corymbosus*, *umbellatus* and *infirmus*, *Solidago patula*, *Cnicus muticus*, *Archemora rigida*, *Lysimachia thyrsoiflora*, *Gerardia purpurea*, *Chelone glabra*, *Seymeria macrophylla*, *Symplocarpus foetidus*, *Peltandra virginica*, *Habenaria hyperborea*, *Cypripedium candidum* and *spectabile*; in the running water: *Mimulus Jamesii* *Ludwigia palustris*, *Berula angustifolia*, *Veronica Anagallis* and *americana*, *Callitriche heterophylla* and *Anacharis canadensis*.

In the stagnant water of an artesian sulphur well grows abundantly *Zannichellia palustris*, before the boring of this well never observed in our vicinity.

The species of the larger open swamps are: *Epilobium palustre* and *coloratum*, *Elodes virginica*, *Proserpinaca palustris*, *Cicuta maculata* and *bulbifera*, *Sium cicutæfolium*, *Aster puniceus*, *Novi Belgii*, *junceus*, *salicifolius*, *paniculatus*, *Coreopsis aristosa* *Lobelia Kalmii*, *Utricularia intermedia*, *Pedicularis lanceolata*, *Polygonum sagittatum*, *Rumex orbiculatus* and *verticillatus*, *Acorus calamus*, *Typha latifolia*, *Triglochin palustre* and *maritimum*, *Dulichium spathaceum*, *Eleocharis palustris*, *Eriophorum gracile*, *Rhynchospora alba*, *Carex polytrichoides*, *teretiusecula*, *filiformis*, *comosa*, *riparia*, *monile*, *Muhlenbergia glomerata*, *Phragmitis communis*, *Phalaris arundinacea*, *Aspidium Thelypteris* and *Osmunda regalis*. The two latter in a cold bog together with *Salix candida* and *myrtilloides*.

In stagnant water of the sloughs where the silt is covered by about a foot deep of water we find: *Ranunculus multifidus*, *Utricularia vulgaris*, *Sagittaria variabilis* *Sparganium eurycarpum*, *Alisma Plantago*, *Scirpus validus*, *Potamogeton pauciflorus*, *Polygonum amphibium*, *Lemna minor*, *polyrrhiza* and *trisulca*, *Nymphaea tuberosa*, *Nelumbium luteum*, *Pontederia cordata* and *Zizania aquatica*. The latter sometimes 4 meter high.

The running water of creeks and shallow places in the river is the abode of *Schollera graminea*, *Valisneria spiralis*, *Najas flexilis*, *Ceratophyllum demersum*, *Nasturtium lacustre*, *Potamogeton natans*, *pectinatus* and *pusillus*.

Wet sandy banks harbor with preference: *Clematis Pitcheri*, *Desmanthus brachylobus*, *Corydalis aurea*, *Polanisia graveolens*, *Conochea multifida*, *Euphorbia heterophylla*, *Echinodorus rostratus*, *Cyperus diandrus*, in *flexus* and *phymatodes*, *Hemicarpha subsquarrosa*, *Fimbristylis autumnalis*, *Scirpus pungens*, *Eragrostis reptans*, *Frankii* and *capillaris*.

Where the banks are flat and miry, there are: *Nasturtium palustre* and *sessiliflorum*, *Cardamine hirsuta*, *Gratiola virginiana*, *Bidens chrysanthemoides* and *connata*, *Eclipta alba*, *Ilysanthes gratioloides*, *Lippia lanceolata*, *Sagittaria heterophylla*, *Iris versicolor*, *Eleocharis obtusa* and *acicularis*.

Along brooks we find: *Thalictrum cornuti*, *Silene nivea*, *Hypericum pyramidatum*, *Hibiscus militaris*, *Thaspium barbinode*, *Artemisia Ludoviciana*, *Erigeron philadelphicum*, *Solidago lanceolata* and *tenuifolia*, *Silphium perfoliatum*, *Cacalia suaveolens*, *Plantago cordata*, *Scrophularia nodosa*, *Carex shortiana*, *Leersia oryzoides*, *Glyzeria nervata* and *fluitans*, *Panicum virgatum*.

## ROADSIDES, WASTE PLACES, PASTURES AND CULTIVATED SOIL.

Of roadsides, wastes places in the neighborhood of houses and yards, mostly immigrated plants took possession, but some of the indigenous ones kept their places: *Lepidium virginicum*, *Mollugo verticillata*, *Erigeron canadense*, *Ambrosia artemisiaefolia*, *Dysodia chrysanthemoides*, *Bidens frondosa*, *Erechtides hieracifolia*, *Artemisia biennis*, *Verbena stricta*, *urticifolia* and *bracteosa*, *Solanum carolinense*, *Datura Tatula*, *Polygonum aviculare* and *erectum*, *hydropiper* and *pennsylvanicum*, *Hordeum pratense* and *Eragrostis pectinacea*.

On pastures prevail *Trifolium repens*, *Poa pratensis* and *compressa*; and on sandy places *Cyperus filiculmis*, *Vilfa aspera* and *vaginæflora*, *Panicum autumnale*.

Along fences many tall plants are preserved: *Napaea dioica*, *Gaura biennis*, *Oenothera biennis*, *Ambrosia trifida*, *Helianthus grosseserratus* and *doronicoides*, *Lactuca canadensis* and *Asclepias cornuti*.

The indigenous weeds between the cultivated plants are: *Sisymbrium canescens*, *Potentilla norvegica*, *Erigeron annuum*, *Xanthium canadense*, *Veronica peregrina*, *Ipomœa pandurata*, *Physalis virginiana* and *lancolata*, *Chenopodium album* and *hybridum*, *Euphorbia maculata* and *hyperici folia*, *Panicum capillare* and *crus galli*, *Cenchrus tribuloides*.

## IMMIGRATED PLANTS.

Before this country was settled by our race, at the time when the red man hunted the buffalo on the prairie and the elk in the forest, the virgin soil was intact, nature reigned undisturbed. When the white man came with his plow, he introduced voluntary or involuntary many foreign plants, which by and by spread and supplanted indigenous plants on the cultivated land.

It would promote phytogeography, when for each local flora that immigration could be historically verified and transmitted to posterity. In regard to our flora an attempt shall herewith be made as far as possible:

The species which immigrated partly from Europe, partly from tropical countries, are either fully naturalized and form an integral part of our present flora, or they are adventives, *i. e.*, new comers, mostly escaped from cultivated land or gardens, that may afterwards become naturalized, after a more or less prolific propagation, or become extinct again, when the chances are less favorable.

Perfectly naturalized and common around Peoria in the year 1852 were; *Sisymbrium officinale* Scop., *Brassica nigra* L., *Capsella pursa pastoris* Moench, *Portulaca oleracea* L., *Malva rotundifolia* L., *Sida spinosa* L.,

Abutilon Avicennae Gært., Trifolium pratense L., Pastinaca sativa L., Maruta cotula DC., Lappa officinalis All., Verbascum Thapsus L., Chenopodium urbicum L., Chenopodium botrys L., Chenopodium ambrosioides L., Polygonum persicaria L., Polygonum Convolvulus L., Rumex crispus L., Cannabis sativa L., Phleum pratense L., Eragrostis poaeoides Beauv. var megastachya, Eragrostis pilosa Beauv., Bromus secalinus L., Panicum sanguinale L., Setaria glauca Beauv.

Old settlers, but not so common, are: Hypericum perforatum L., Veronica arvensis L., Nepeta cataria L., Nepeta glechoma Benth., Marrubium vulgare L., Melilotus alba Lam., Malva sylvestris L., Martynia proboscidea Glox., Amarantus spinosus L., Rumex obtusifolius L., Rumex acetosella L., Dactylis glomerata L., Panicum glabrum Gaud.

First observed between 1855 and 1860, and now very common: Sonchus asper Vill., Linaria vulgaris Mill., Leonurus cardiaca L., Echinopspermum Lappula Lehm., Cynoglossum officinale L.

New settlers after 1860 and before 1870 and now common: Nasturtium officinale R. Br., Stellaria media, Smith; less common: Verbascum Blattaria L., Melilotus officinalis Willd., Eleusine indica Gärt., Setaria verticillata Beauv. Trifolium arvense L. Lychnis Githago Lam., Camelina sativa L. Cirsium arvense Scop.

Single specimens were collected 1852 (but not seen since) of: Raphanus Raphanistrum L., Nicandra physaloides Gært., Inula Helenium L and Leucanthemum vulgare L.

The latter re-appeared 1885 on the railroad tracks.

In 1886 first appeared Conium maculatum L., and Lactuca scariola L.

Several years ago single stocks of two grasses appeared along railroad tracks, but not seen since: Triticum repens L and Lolium perenne L. Probably the seed dropped from the cars but did not propagate.

Some species sometimes escape from gardens or cultivated lands, but are, until now, not naturalized: Argemone mexicana L., Nasturtium Armoracia Fr., Hibiscus Trionum L., Medicago sativa, Rosa rubiginosa L., Anethum graveolens L, Daucus carota L, Helianthus annuus L., Tanacetum vulgare L., Centaurea Cyanus L., Mentha viridis L., Satureja hortensis L., Ipomoee purpurea Lam., Ipomoee Nil Roth, Lycium vulgare Dun., Polygonum orientale L., Fagopyrum esculentum Mœnch, Asparagus officinalis L., Phalaris canariensis L and Setaria Italica Kunth.

There is a number of species which are doubtful whether indigenous or naturalized,

Cerastium triviale Link (C. vulgatum L. spec., C. viscosum L. herb et auct. americ.) is the first time mentioned by Pursh (Flora Am. sept. L., 320) and then by Nuttall (Gen. of N. Am. pl. I., 291), neither of them says whether the plant be introduced or not. Barton (Fl. phil. I., 216) says that perhaps only C. longepedunculatum Muhl (C. nutans Raf.) and C. arvense L are indigenous. Decidedly as an introduced plant it is spoken of by Beck (Bot. of N. St. 51) by Dewey (Herbaceous plants of Mass. 89)



by Darlington (Fl. cestr. 33) and Torrey (Flora of N. Y. L., 99). In Torrey and Gray's Flora L. 188 it is left doubtful whether introduced or not, and Gray in Man. of Bot. says: perhaps indigenous to the country. Not a few plants, common to North America and Europe, are supposed to have come to the eastern states on a double way by new introduction from Europe or by old migration from the north in both continents. The question is, whether this in regard to our plant is possible and probable.

A. de Candolle in Geogr. bot. 748 says: *Cerastium vulgatum* L. et *Cerastium viscosum* L. paraissent manquer encore à l'Asie orientale et au nord-ouest de l'Amérique, ce qui me fait croire à l'introduction aux États-unies.

The plant is found in Iceland (Hooker Tour in Iceland II., 324) in Labrador (Meyer Flor. Labr. 94) in Spitzbergen (Martens flor. arct. 8) in Greenland (Lange in Etzels Greenland 634). So an arctic connection with the eastern continent is proved. After Ledebour (Fl. ross. I., 408), who takes the species in a wide sense, it extends through Siberia to Kamtschatka, and his varieties *Grandiflorum* and *Behringianum* to Alaska. The latter after Watson (Kings Rep. V., 38) occurs in the Uintah Mountains in an altitude of 10,000 feet, and in the Rocky Mountains it was found by Parry (Pl. of Rock. Mount. in Proc. Ac. n. s. Phil. 1863, p. 55) and Gray in Pl. Wright, L. 18, mentions: *Cerastium vulgatum* L., *C. triviale* Auct., in ravines of the Organ Mountains N. Mex. That means, no doubt, L. spec. and not L. herb as in Man. of Bot.

Now, if a plant is distributed from the arctic region to New Mexico, it is possible that it spread in the same direction to Illinois. It is not mentioned in Agassiz Lake Superior, but Houghton collected there *C. viscosum* L. (Schoolcraft Sources of the Mississippi), and we find it in Lapham's Catalogue of Wisconsin plants. In both cases it is not said whether L. herb or spec. is understood.

I found the plant on a grassy place at the bank of a little brook at that time remote from a settlement, what made me suppose, that the plant did not recently immigrate.

*Solanum nigrum* L. is a polymorphus cosmopolite, and now ranged amongst the indigenous by Gray in Fl. of N. Am. I., 227.

*Datura Tatula* L.—The question, whether this is a proper species or a variety, and the probability of an American origin, A. de Condolle in Geogr. Bot., 731, has extensively treated. Another question is, whether we have the plant from South America, as is supposed. When that is so, the immigration must be a very old one. Western farmers affirm that in remote new settlements the plant appear as soon as the land is broken. It is a well known fact, that the seeds of most Solanaceæ keep the germinative power a long time, and so it is probable that the seeds had been buried in the ground long before they had a chance to germinate. The white species *Datura stramonium* was, only a few years ago, the first time seen—in the yard of a druggist's house!

*Chenopodium album* L. and *hybridum* L.—The American botanists took those plants unanimously for immigrated ones. Amongst the fifty-five species described by Mocquin in *Prodromus* XIII., 2, are only two, the exclusive habitat of which is conceded to North America, one in California, the other in Carolina and Texas; the species of the genus are equally distributed all over the globe, and the species in question are cosmopolites, the original home unknown; they may have spread by colonization in settled countries, but recently both species were found in the Rocky Mountains of Colorado in an altitude of 10,000 feet (Porter & Coulter, *Flora of Colorado*, 110), *C. album* L. from the Great Bear Lake, 66° N. L. to Nevada, and *C. hybridum* L. from the Saskatchewan to the Wahsatch Mountains. Watson (in King's Report, V. 287), declares both to be indigenous, and in his Revision of N. Am. *Chenopodiaceæ* (*Pr. Am. Ac.* IX, 97), under *C. hybridum*, he says: "Introduced eastward, but indigenous from Kentucky, Texas, and New Mexico to Oregon." I never doubted that the variety *viridis* be indigenous, as it is found in our vicinity only in the shade of the woods.

*Amarantus retroflexus* L. and *albus* L.—These species, too, were ever taken for immigrated plants. To Mocquin it is an open question, whether the former came to Europe from America, as to the latter he is sure of it: he gives as habitat Pennsylvania and Virginia. In the meantime the plants were found in the deserts beyond the Rocky Mountains, "far from cultivated fields," as Watson remarks in King's Report, and "probably indigenous." De Condolle did not include them in the list of immigrated plants in *Geogr. Botan.*

There is a third species, *A. blitoides* Wats., which I first observed about ten years ago, when I took it for a variety of *A. albus*. Now it grows in immense numbers around houses. Watson described it as a new species (*Flora of California*, II., 41), "Mexico to Northern Nevada and Iowa, and spreading then eastward." As its migration seems to be spontaneous and steady, and being a North American plant, I ranged it in the list of indigenous plants.

*Poa annua* L. *Poa compressa* L. and *Poa pratensis* are no doubt circumpolar. They occur from Europe through Siberia to Kamtschatka, *Poa annua* in Sitka (Alaska), after Ledebour (*Flora Rossica* IV., 372-78), in Greenland and Iceland, after Martens (*Fl. arct.*), *P. pratensis* in Greenland, Iceland and Labrador, *Poa compressa* in Labrador, after Meyer (*Plant. Labrad.*, 19). So we may have the plants from the North as well as from the East.

*Panicum crus Galli* L. is a cosmopolite, the original home of which to verify will hardly be possible; it occurs throughout North America, even in the deserts of Utah and Nevada.

*Agrostis alba* L. and *A. vulgaris* With., have the same distribution as the three species of *Poa*. They are in Gray's Manual acknowledged as indigenous.

## CULTIVATED PLANTS.

The foreign, not American, trees and shrubs, planted for shade or ornament around houses, are: *Aesculus Hippocastanum*, *Ailanthus glandulosus*, *Populus alba* and *dilatata*, *Salix alba* and *babylonica*, *Tilia europæa*, *Philadelphus coronarius*, *Syringa vulgaris*, *Ligustrum vulgare*, *Rhamnus catharticus*. *Lycium vulgare*, *Rhus cotinus* and *Catalpa Kæmpferi*.

American species from southern Illinois: *Liriodendron tulipifera*, *Catalpa speciosa*, *Robinia pseudacacia*, *Wistaria frutescens*; from north Illinois: *Betula papyracea*; from other States: *Populus balsamifera*, *Pyrus americana*, *Catalpa bignonioides*, *Cratægus cordata*, *Ribes aureum*, *Symphoricarpus racemosus*, *Lonicera sempervirens* and *Maclura aurantiaca*.

Coniferæ: *Pinus Strobus*, *Abies balsamea* and *Larix americana*, and the foreign *Pinus austriaca* and *Abies excelsa* thrive only in clayey soil of the bluffs.

In the orchard the apple in many and often excellent varieties takes the first place; less common are cherries, pears and plums. Peaches suffer from severe winters and late frosts. Small fruit for the market are raised: Strawberries, raspberries, gooseberries and currants.

The principal crops of cultivated farm land in Illinois are: Maize, wheat, oats, rye, barley, buckwheat and potatoes, together (in 1875) on 13¼ millions of acres, about 38 p. c. of the area of the State. Hay was made in the same year on 2¼ millions of acres on uncultivated farm land.

Maize alone was cultivated on more than eight millions of acres. Indeed no Illinois farm is so prosperous as the large farm Esperanza, in Mexico, of which Humboldt, in his *Essay Politique sur la Nouvelle Espagne*, says: "Une fanèque de mais en produit quelquefois huit cent." Still the Illinois farmers reap nearly the average crop of the fertile parts of that country, which is, after Humboldt, 3-400 fold, that would be 288 fold after the following table, which I owe to the kindness of Mr. Roswell Bills, Sec. of Peoria Co. Agricult. So.:

	TIME OF SOWING.	TIME OF HARVEST.	QUANTITY OF SEED.	CROP.
Maize .....	May 14th.	Oct. 10th.	5 quarts,	45 bushels.
Winter Wheat ...	Sept. 1st.	July 1st.	1½ bushels.	20 "
Spring Wheat....	Mch. 25th.	July 15th.	1½ "	15 "
Rye .....	Sept. 10th.	June 25th.	1½ "	20 "
Oats .....	April 10th.	July 15th.	2½ "	50 "
Barley .....	?	June 20th.	2½ "	50 "
Buckwheat .....	June 25th.	Sept. 25th.	½ "	20 "
Potatoes .....	May 15th.	Oct. 1st.	5 "	100 "

In the year 1875, wheat was grown on 2.6 millions of acres, oats on 2.27 millions of acres, and potatoes on 118,715 acres, with a crop of 128 bushels per acre. The cultivated fodder are clover and timothy.

Other farm products are: Peas, beans, sweet potatoes, pumpkins, cucumbers, melons, water melons and tomatoes. What the gardening bring to market is the same as in all civilized countries of the temperate zone.

## SYSTEMATIC SYNOPSIS OF THE FLORA OF PEORIA.

To indicate the relative number of localities and the relative number of individuals in each locality, roman figures are used for the former, and arabic ones for the latter; so *Eleocharis palustris* X., 10, means that the plant occurs on all favorable places, in swampy places, flat banks a. s. o. in the greatest number; *Corylus americana* VIII, 10, that it is found in most favorable localities; *Thuja occidentalis* I., 1, that this tree was observed on a single place a single specimen. The abbreviated geographical names\* express the limits of distribution of each species.

### \*ABBREVIATED GEOGRAPHICAL NAMES.

[Those of the States are well known, and therefore omitted.]

All—eghannies, All. (N. Ca.), All. (Ga.), Alleghannies southward to N. Ca. or Ga.  
 Art—ic coast.  
 Atl—antie coast.  
 Can—ada.  
 G—ulf coast.  
 Hud—son.  
 Labr—ador.

Miss—issippi river.  
 U. Miss.—Upper Mississippi.  
 U. Mo.—Upper Missouri.  
 N. E.—New England.  
 N. F.—New Foundland.  
 Pac—ific coast.  
 R. Mts.—Rocky Mountains.  
 Sask—atehewan.

### ABBREVIATED NAMES OF AUTHORS.

Ach—arius.	Dun—al.	Ländl—ey.	Schreb—er.
Ait—on.	Ehrh—art.	Lk.—Link.	Schrad—er.
Anders—son.	Ell—iot.	Lightf—oot.	Schk—uhr.
Andr—ews.	Englm—ann.	L'Her—itier.	Schult—es.
Aust—in.	F. & M. Fischer & Mayer	Lois—cleur.	W. P. Sch—imper.
Bart—on.	Fr—ies.	Marsh—all.	Schpr—Schimper.
Beauv—ois.	Froel—ich.	Mart—ins.	Schwäg—richen.
Benth—am.	Gartn—er.	Mey—A. C. Meyer.	Schw—einitz.
Bernh—ardi.	Gand—ichaud.	Michx—Michaux.	Scop—oll.
Big—elow.	Gm—elin.	Mill—er.	Sh. & P.—Short and
Bisch—off.	Good—enough.	Moeq—uin.	Peter.
Bland—ow.	A. Gr—ay.	Muell—er.	Shuttl—eworth.
A. Br—aur.	Grev—ille.	Muhel—enberg.	Sibth—orp.
R. Br—own.	Gris—ebach.	Murr—ay.	Sm—ith.
Brid—el.	Gron—ovius.	Norm—ann.	Spr—engel.
Er. Sch. Bruch and	Hassk—er.	Nutt—all.	Spring—er.
Schimper.	Hedw—ig.	Pers—oon.	Sol—ander.
Br. Eu. Bryologia Eu-	Hoffm—ann.	Ph.—Pursh.	Steud—el.
ropea.	Hook—er.	Planch—on.	Sull—ivant.
Buckl—ey.	Hornsch—uch.	Poir—et.	Sw—artz.
Cav—aniles.	Hueb—ener.	Raf—inesque.	Trin—ius.
Chois—y.	Hud—son.	Rich—ard.	Torr—ey.
Curt—is.	H. B. K. Humboldt	Richards—on.	T. Gr.—Torrey and
Darl—ington.	Bonpland & Kunth.	Ridd—ell.	Gray.
DC.—deCandolle.	Jacqu—in.	Rostk—ovius.	Tuek—erman.
ADC.—Alphonse DC.	Juss—ien.	R. Sch.—Røemer and	Vent—enat.
Desn.—Decaisne.	Kth.—Kunth.	Schultes.	Wang—enheim.
Desf—ontaiue.	Lag—asca.	R. P.—Ruiz & Pavon.	Wahl—enberg.
Dew—ey.	Lam—ark.	Rottb—oll.	Walt—er.
Dietr—ich.	Lamb—ert.	Salisb—ury.	Wats—on.
Dgl.—Douglas.	Lehm—ann.	Sartw—ell.	Willd—enow.
Dum—ortier.	L—innaus.	Schleich—er.	With—ering.

**Ranunculaceæ.** In N. Am. 18 Gen. 147 Spec.

*Clematis Pitcheri* T. Gr. sandy banks V. 5 Ill.—N. Mex.

*Clematis virginiana* L. shady banks III. 2 Atl.—N. Mex. G.—Sask.

*Anemone decapetala* L. dry prairies, hill-sides III. 4 Ariz.—N. Ca.—Utah—Ill.

*Anemone cylindrica* Gr. copses V. 4 Mass.—Ill. Wis.—N. Mex.

*Anemone virginiana* L. woods V. 5 N.E.—Ark. All. (S. Ca.)—55° N. L.

*Anemone dichotoma* L. bottom wood V. 7 Can.—All. (Pa.) Ark. R. Mts.—Arct.

*Hepatica triloba* Chaix var. *acutiloba* wood VI. 5 Atl.—Alaska G.—U. Mo.

*Thalictrum anemonoides* Michx. wooded hill-sides II. 5 Can.—N. Ca. La.—U. Miss.

*Thalictrum dioicum* L. woods II. 2 N.E.—La.—67° N. L.

*Thalictrum purpurascens* L. woods, copses III. 3 N.E.—La.—R. Mts.

*Thalictrum cornuti* L. woods, shady banks IV. 3 Atl.—N. Mex. G.—56° N. L.

*Ranunculus multifidus* Ph. stagnant water I. 4 N.E.—N. Ca.—La.—R. Mts.—Arct.

*Ranunculus abortivus* L. woods VIII. N.F.—La.—R. Mts. S. Ca.—57° N. L.

*Ranunculus recurvatus* Poir. moist woods III. 3 Atl.—Or. G.—Labr.

*Ranunculus fascicularis* Muhl. prairies and wood openings VI. 6 N. E.—R. Mts.

*Ranunculus repens* L. woods X. 6 All.—Pac. G.—Can.

*Isopyrum biternatum* T. Gr. shade VI. 5 G.—Oh.—U. Miss.

*Caltha palustris* L. springy places in bottom woods III. 6 Atl.—Pac. S. Ca.—Can.

*Aquilegia canadensis* L. wooded hillsides VI. 3 Atl.—N. Mex. Ga.—Huds.

*Delphinium tricorne* Michx. copses IV. 2 All.—Up. Mo.—La.

*Hydrastis canadensis* L. shady woods II. 3 Can.—Ga.—Up. Miss.

*Actaea alba* Big. shady woods V. 3 N.E.—La.—55° N. L.

**Anonaceæ.** In N. Am. 2 Gen. 5 Spec.

*Asimina triloba* Dun. bottom woods V. 4 All.—Miss. G.—Gr. Lakes.

**Menispermaceæ.** In N. Am. 3 Gen. 5 Spec.

*Menispermum canadense* L. bottom woods Atl.—R. Mts. G.—Can.

**Berberidaceæ.** In N. Am. 7 Gen. 15 Spec.

*Caulophyllum thalictroides* Michx. shady woods IV. 3 N.E.—N. Ca.—Up. Miss.

*Jeffersonia diphylla* Pers. shady woods I. 4 All. (Tenn.)—Mich.—Ill.

*Podophyllum peltatum* L. woods VIII. 6 Atl.—Up. Mo. G.—Can.

**Nymphæaceæ.** In N. Am. 5 Gen. 13 Spec.

*Nelumbium luteum* Willd. waters III. 10 All.—Miss. G.—Can.

*Nymphæa tuberosa* Paine waters III. 6 Atl.—Miss.

*Nuphar advena* Ait. waters I. 5 Atl.—Pac. G.—Can.

**Papaveraceæ.** In N. Am. 12 Gen. 17 Spec.

*Sanguinaria canadensis* L. woods VI. 5 Atl.—Miss G.—Can.

**Fumariaceæ.** In N. Am. 3 Gen. 17 Spec.

*Dicentra cucullaria* D. C. wooded hillsides VI. 5 N.E.—N. Ca.—Up. Miss.

*Corydalis aurea* Willd. sandy banks, fields II. 6 Atl.—W. Tx. R. Mts. G—64° N. L.

**Cruciferae.** In N. Am. 37 Gen. 217 Spec.

*Nasturtium sessiliflorum* Nutt. banks bottom III. 4 Fla.—Tex.—Ill.

- \* † *Nasturtium sinuatum* Nutt. bottom I. 1 Miss.—Pacif.  
*Nasturtium palustre* D.C. bottom VIII. 6 N.E.—La.Pacif.—Arct.  
*Nasturtium lacustre* Gr. inundated bottom II. 4 Can. N.Y. Ky. La.—Up.  
 Miss.  
*Dentaria laciniata* Muhl. woods V. 5 Fla.—La. N.E.—Up.Miss.  
*Cardamine rhomboidea* D.C. bottom, springy places V. 7 Atl.—R.Mts. G.—  
 Can.  
*Cardamine hirsuta* L. bottom VIII. 8 Atl.—Pacif. G.—Arct.  
*Arabis dentata* T.Gr. bottom III. 3 N.Y.—Tenn.—Up.Miss.  
*Arabis canadensis* L. shady hillsides N. 4 N.E.—Ark.—Can.  
*Arabis laevigata* D.C. rocky hillsides N. 4. Can.—Va. N.E.—Up.Miss.—Ark.  
*Thelypodium pinnatifidum* Wats. bottom V. 5 Oh.—Ill.—La.  
*Sisymbrium canescens* Nutt. fields V. 8 N.Y.—Fla.—La.—Cal.—Arct.  
*Draba caroliniana* Walt. hillsides V. 8 N.E.—Ga.—La.—Up.Miss.  
*Lepidium virginicum* L. roadsides, waste places X. 8 Atl.—La.—Up.Mo.

**Capparidaceæ.** In N. Am. 9 Gen. 25 Spec.

*Polanisia graveolens* Raf. sandy banks IV. 6 Can.—Fla.—Ark.—Up.Miss.

**Violaceæ.** In N. Am. 2 Gen. 33 Spec.

- Jonidium concolor* B.H. shady woods II. 3 N.Y.—All.—Ill.  
*Viola cucullata* Ait. woods and prairies VIII. 5 Atl.—Pacif. G.—Arct.  
*Viola cucullata* var. *palmata* Gr. woods I. 4.  
*Viola sagittata* Ait. dry openings III. 4 Atl.—Miss. G.—Can.  
*Viola delphinifolia* Nutt prairie III. 5 Ill.—Up.Mo.  
*Viola pedata* L. dry openings II. 5 Atl.—Miss. G.—53° N.L.  
 ——— var. *bicolor*.  
*Viola pubescens* Ait. woods VI. 4 N.E.—All. (Ga.)—R.Mts.

**Cistaceæ.** In N. Am. 3 Gen. 17 Spec.

- Helianthemum canadense* Michx. open woods, hillsides II. 4 Atl.—Miss. G.  
 —Can.  
*Lechea major* Michx. dry woods, hillsides III. 5 Atl.—Miss. G.—Can.  
*Lechea minor* Lam. dry woods, hillsides II. 8 Atl.—Up.Mo. G.—Can.

**Hypericaceæ.** In N. Am. 3 Gen. 35 Spec.

- Hypericum pyramidatum* Ait. banks II. 3 N.E.—Ill. Wisc.  
*Hypericum corymbosum* Muhl. copses V. 5 N.E.—N.Ca.—Miss.  
*Hypericum sphaerocarpum* Michx. banks II. 4 Oh.—Ill.—La.  
*Hypericum nudiflorum* Michx. copses V. 5 N.E.—Up.Miss. Fla.—La.  
*Elodes virginica* Nutt. swampy bottom I. 2 N.E.—Up.Miss. Fla.—La.

**Caryophyllaceæ.** In N. Am. 12 Gen. 129 Spec.

- Silene stellata* Ait. copses VI. 4 N.E.—All.—La.—Up.Miss.  
*Silene nivea* D.C. bottom II. 4 Pa.—Ill.  
*Silene antirrhina* L. dry hills V. 3 Atl.—Cal. Or. Tex.—Can.  
*Stellaria longifolia* Muhl. grassy places II. 6 N.E.—Va.—La.—R.Mts.—  
 Alaska.  
*Arenaria lateriflora* L. shady hillsides I. 4 N.E.—Up.Mo. Or. Alaska.  
*Cerastium triviale* Link. (*viscosum* L. herb) grassy places I. 3 N.Engl.—Fla.  
 —N.Mex.—Alaska.  
*Cerastium nutans* Raf. moist places VII. 4 Vt.—Minnes. N.Ca.—N.Mex.—  
 Cal.

**Paronychieæ.** In N. Am. 5 Gen. 17 Spec.

*Anychia dichotoma* Michx. openings VI. 8 N.E.—Up.Miss. Ga—Ark.

\*The species marked †, found long ago at a single place, have not been seen again, and may partly be extinct in our flora

**Portulacaceae.** In N. Am. 9 Gen. 44 Spec.

*Claytonia virginica* L. openings VI. 6 Atl.—N.Mex. Ga—Can. Ariz.—Alaska.

**Malvaceae.** In N. Am. 17 Gen. 104 Spec.

*Callirhoe triangulata* Gr. prairies II. 4 All. (Ala—N.Ca)—Up.Miss.

*Napaea dioica* L. fences, open places, copses III. 5 All.—Ill.

*Hibiscus militaris* Cav. bottom II. 4 All. (Pa.—Ala.)—Miss.

**Tiliaceae.** In N. Am. 2 Gen. 4 Spec.

*Tilia americana* L. woods V. 3 N.E.—All—Ia.—52° N.L.

**Linaceae.** In N. Am. 1 Gen. 17 Spec.

*Linum sulcatum* Ridd. prairies, open woods, V. 5 N.E.—N.Ca.—Up.Mo.

**Geraniaceae.** In N. Am. 6 Gen. 27 Spec.

*Geranium maculatum* L. open woods V. 5 Atl.—Up.Mo. G.—Can.

†*Floerkea proserpinacoides* Willd. bottom I. 4 N.E.—Utah.

*Impatiens pallida* Nutt. moist, shady woods II. 5 Atl.—Oreg. Ga—Can.

*Impatiens fulva* Nutt. moist shady woods VI. 5 Atl.—Oreg. G.—66° N.L.

*Oxalis violacea* L. dry hillsides VI. 3 Atl.—N.Mex. G.—Can.

*Oxalis stricta* L. bottom, cultivated land VIII. 5 Atl.—Pacif. G.—Can.

**Rutaceae.** In N. Am. 5 Gen. 11 Spec.

*Zanthoxylum americanum* Mill. copses VIII. 4 N.E.—Va.—Up.Miss.

*Ptelea trifoliata* L. woods, banks VI. 3 Lake Erie—N.Mex. Fla.—Tex.

**Anacardiaceae.** In N. Am. 2 Gen. 14 Spec.

*Rhus glabra* L. dry hillsides VIII. 5 Atl.—Oreg. G.—Sask.

*Rhus toxicodendron* L. bottom woods VIII. 5 Atl.—Oreg. G.—Sask.

*Rhus aromatica* Ait. hillsides IV. 2 Vt.—Kas. G.—Sask.

**Vitaceae.** In N. Am. 2 Gen. 15 Spec.

*Vitis aestivalis* Michx. woods VII. 5 Atl.—Sonora G.—Can.

*Vitis cordifolia* Michx. woods VII. 5 Atl.—Miss. G.—Can.

*Vitis riparia* Michx. woods IV. 3 N.E.—Va.—N.Mex.

*Ampelopsis quinquefolia* Michx. woods VII. 6 Atl.—N.Mex. G.—Can.

**Rhamnaceae.** In N. Am. 12 Gen. 47 Spec.

*Rhamnus lanceolatus* Ph. woods V. 3 W.Pa.—Tenn.—Up.Miss.

*Rhamnus alnifolius* L'Her. swampy places II. 4 N.Y.—Ill.—Huds.—Cal.

*Ceanothus americanus* L. copses VI. 5 Atl.—R.Mts.—Tex. G.—Can.

**Celastraceae.** In N. Am. 7 Gen. 15 Spec.

*Celastrus scandens* L. woods V. 3 All. (N.Y.—N.Ca.)—Up.Miss.—47° N.L.

*Euonymus atropurpureus* Jacq. woods, copses V, 3 Can. 47 N.L.—Fla.—Mo.

**Sapindaceae.** In N. Am. 13 Gen. 31 Spec.

*Staphylea trifolia* L. copses V. 4 N.Ca.—Tenn.—47° N.L.—Up.Mo.

*Aesculus glabra* Willd. bottom woods V. 4 W.Pa.—Up.Miss.

*Acer saccharinum* Wang. wood hillsides V. 8 Can. N.E.—All.—Ia.—Lake Winnipeg.

*Acer dasycarpum* Ehrh. bottom woods VII. 9 Can. N.E.—Ga.—Ark.—Wisc.

*Negundo aceroides* Moench. bottom woods IV. 4 Pa.—Fla.—Cal.—Sask 54° N.L.

**Polygalaceae.** In N. Am. 3 Gen. 40 Spec.

*Polygala incarnata* L. dry prairie II. 4 Pa.—Fla.—Ark.—Wisc.

*Polygala sanguinea* L. dry prairie, open woods III. 4 Atl.—N.Mex. G.—Can.

*Pol. gala verticillata* L. sandy places IV. 6 Atl.—R.Mts. G.—Can.  
*Polygala senega* L. dry wooded hillsides IV. 3 N.E.—All.—(N.Ca.)—Miss.—  
 54°N.L.

**Leguminosae.** In N. Am 67 Gen. 736 Spec.

- †*Crotalaria sagittalis* L. sandy banks I. 2 N.E.—Up.Miss.—Fla.—Sonora.  
*Trifolium reflexum* L. bottom woods II. 3 All.—Ill.—Fla.—Tex.  
*Trifolium repens* L. waste places, pastures, roadsides, X. 10 all North  
 America.  
*Psoralea onobrychis* Nutt. copses V. 6 All. (S.Ca.) Oh.—Up.Miss.  
*Psoralea floribunda* Nutt. dry prairies, hillsides V. 6 Ill.—R.Mts.—Ark.—  
 Sonora.  
*Petalostemon violaceum* Michx. prairies, hillsides V. 4 Mich.—N.Mex.—La.  
 —Sask.  
*Petalostemon candidum* Michx. prairies, hillsides, V. 3 Mich.—Sonora.—La.  
 —Sask.  
†*Tephrosia virginiana* Pers. dry prairie I. 1 Atl.—Miss. G.—Can.  
*Amorpha fruticosa* L. bottom, banks V. 5 Pa.—Up.Mo.—W.Tex.—Fla.—L.  
 Winnipeg.  
*Amorpha canescens* Nutt. dry prairie, hillsides V. 6 Mich.—R.Mts.—Ga.—  
 Tex.  
*Astragalus canadensis* L. copses V. 5 All. (N.Y.—Ga.)—La.—Or.—58°N.L.  
*Desmodium nuditorum* D.C. woods I. 3 Atl.—Up.Mo. G.—Can.  
*Desmodium acuminatum* D.C. woods V. 5 Atl.—Up.Mo. G.—Can.  
†*Desmodium pauciflorum* D.C. woods I. 2 Pa.—Ill.—Fla.—La.  
*Desmodium cuspidatum* T.Gr. copses III. 3 Atl.—Up.Mo. G.—Can.  
*Desmodium canescens* D.C. copses VII. 7 Atl.—Miss. G.—Can.  
*Desmodium Illinoense* Gr. prairies, copses V. 3 Ill.  
*Desmodium Dillenii* Darl. copses III. 3 Atl.—Miss. G.—Can.  
*Desmodium paniculatum* D.C. copses, wood openings V. 8 N.E.—Up.Mo.—  
 Fla.—W.Tex.  
*Desmodium canadense* D.C. woods, copses IV. 3 Atl.—R. Mts—N.Ca.—54°  
 N.L.  
*Desmodium sessilifolium* T.Gr. copses I. 5 Pa. Ky.—Tex.—Up.Mo.—Mich.  
*Lespedeza violacea* Pers. copses V. 6 Atl.—Up.Mo.—Tex. G.—Can.  
*Lespedeza reticulata* Pers. copses III. 4 Atl.—Miss. G.—Can.  
*Lespedeza capitata* Michx. copses, wood openings V. 5 Atl.—Up.Mo. G.—  
 Can.  
†*Vicia americana* Muhl. bottom, moist copses I. 2 N.Y.—Ky.—La.—Gr. Bear  
 Lake—N.Mex.—Cal.  
*Lathyrus palustris* L. moist copses III. 4 N.E.—N.Ca.—Pacif.—55°N.L. Lab-  
 rador.  
*Phaseolus diversifolius* Pers. bottom V. 3 Atl.—Up.Mo.—W.Tex. G.—Can.  
†*Phaseolus helvolus* L. sandy soil I. 2 N.Y.—Ill.—Fla. N.Mex.  
*Apios tuberosa* Moench. bottom copses III. 4 Oh.—R.Mts. G.—Can.  
*Amphicarpea monoica* Nutt. woods V. 5 Atl.—Up.Mo. G.—Can.  
*Baptisia leucantha* Nutt. copses V. 4 Oh.—Wisc.—Up.Mo. Fla.—Tex.  
*Baptisia leucophaea* Nutt. prairies V. 3 Ga.—Tex.—Wisc.—Mich.  
*Cercis canadensis* L. woods VI. 3 Pa.—Ill.—Cal. Fla.—La.  
*Cassia marilandica* L. bottom VI. 4 Atl.—Mo. G.—Can.  
*Cassia chamaerista* L. bottom VI. 7 Atl.—N.Mex. G.—Can.  
*Gymnocladus canadensis* Lam. bottom woods V. 3 W.N.Y.—Tenn.—Up.  
 Mo.—46°N.L.  
*Gleditschia triacanthos* L. 5 bottom woods V. 5 W.Pa.—Up.Mo. Fla.—La.



*Desmanthus brachylobus* Benth. sandy banks III. 4 Ill.—Up.Mo. Ky. La.—W.Tex.

**Rosaceae.** In N. Am. 35 Gen. 201 Spec.

- Prunus americana* Marsh. woods, copses V. 4 Atl.—Up.Mo. Tex.—Sask.  
*Prunus virginiana* L. copses V. 3 Atl.—R.Mts.—N.Mex. G.—67°N.L.  
*Prunus serotina* Ehrh. woods V. 3 Atl.—Up.Miss.—W.Tex. G.—62°N.L.  
*Spiraea lobata* Murr. bottom II. 4 All. (Pa.—Ga. Ill. Mich.  
*Spiraea Aruncus* L. wooded hillsides IV. 4 All. (N.Y.—Ga.)—R. Mts. Cal. Sitka.  
*Agrimonia Eupatoria* L. woods V. 3 Atl.—Pacif. G.—Can.  
*Agrimonia parviflora* Ait. woods II. 3 All. (Pa.—N.Ca.)—Ill.—La.  
*Geum album* Gm. woods, copses V. 4 N.E.—Ga.—Ill.  
*Geum virginianum* L. 4 wet prairies I. 4 N. E.—R.Mts.—W.Tex.  
*Potentilla norvegica* L. fields VI. 5 N.E.—N.Mex.—Or.—Alaska—Arct.  
*Potentilla canadensis* L. woods, copses VI. 3 N.E.—All.—La. Can.—Up.Mo.  
*Potentilla arguta* Ph. prairies, copses III. 4 N.E.—R.Mts.—65°N.L.  
*Fragaria virginiana* Ehrh. wooded hillsides VII. 5 Atl.—Cal.—Or. G.—65°N.L.  
*Rubus occidentalis* L. copses VI. 5 N.E.—All.—R.Mts.—Or.  
*Rubus villosus* Ait. copses VIII. 6 Atl.—Up.Mo. G.—Can.  
*Rosa setigera* Michx. bottom VI. 5 W.N.Y.—Fla.—Miss.—47°N.L.  
*Rosa carolina* L. woods I. 2 Atl.—Miss. G.—Can.  
*Rosa parviflora* Ehrh. hillsides V. 5 N.F.—Fla.—Miss.  
*Rosa blanda* Ait. prairies, hillsides III. 5 N.E.—Up.Miss. N. Mex.—Cal.—69°N.L.  
*Cratægus coccinea* L. wooded hillsides II. 3 N.E.—Up.Mo.—Fla.—N.Mex.  
*Cratægus tomentosa* L. 5 bottom woods V. 4 N.E.—All.—La.—Up. Miss.  
*Cratægus subvillosa* Schrad. bottom woods VI. 4 N.E.—La.—Up.Miss.  
*Cratægus crus galli* L. bottom woods III. 5 Atl.—Miss. G.—Can.  
*Pyrus coronaria* L. wooded hillsides, copses V. 5 W.N.Y.—All.—La.—Up. Miss.  
*Amelanchier canadensis* T.Gr. var *Botryapium* wooded hillsides V. 3 Atl.—Cal. G.67°N.L.

**Saxifragaceæ.** In N. Am. 23 Gen. 135 Spec.

- Ribes rotundifolium* Michx. woods V. 5 N. E.—All. (N.Ca.)—La.—R.Mts.  
*Ribes floridum* L. woods V. 3 N.Y.—Va.—Ky.—Up.Mo.—54°N.L.  
*Hydrangea arborescens* L. wooded hillsides III. 4 N.J.—Fla.—Miss. G.—Can.  
*Parnassia caroliniana* Michx. bottom, springy places III. 5 Atl.—Miss.G.—Can.  
*Saxifraga pennsylvanica* L. wet prairies II. 2 N.E.—Va.—Up.Miss.  
*Heuchera hispida* Ph. wooded hillsides V. 3 All. (Va.—N.Ca.)—Up.Miss.  
*Mitella diphylla* L. rocky hillsides V. 6 N.E.—All. (N.Ca.)—Up.Miss.

**Crassulaceæ.** In N. Am. 5 Gen. 40 Spec.

- Penthorum sedoides* L. bottom V. 8 Atl.—Miss. G.—Can.

**Hamamelaceæ.** In N. Am. 15 Gen. 3 Spec.

- Hamamelis virginica* L. wooded hillsides II. 4 Atl.—Miss. G.—Can.

**Halorageæ.** In N. Am. 3 Gen. 14 Spec.

- †*Proserpinaca palustris* L. swamps I. 3 Atl.—Up.Miss.—W.Tex. G.—Can.

**Onagraceæ.** In N. Am. 15 Gen. 148 Spec.

- Circaea Lutetiana* L. shady woods V. 3 N.E.—All.—La.—Up.Mo.  
*Gaura biennis* L. fences, fields VIII. 5 N.Y.—Miss.—Ga. N.Mex.  
*Epilobium palustre* L. var. *lineare* ditches V. 5 N.E.—All. (N.Ca.)—Up.Miss.  
 Or.—Arct.  
*Epilobium coloratum* Muhl. ditches, wet prairies III. 5 N.E.—All. (N.Ca.)  
 Sonora—Cal.—Or.—54°N.L.  
*Oenothera biennis* L. bottom, fields VI. 5 Atl.—W.Tex. Cal. Or. G.—56°N.L.  
*Oenothera rhombipetala* Nutt. sandy soil I. 4 Up.Miss.—Tex.—Cal.  
*Oenothera fruticosa* L. wet prairies II. 5 Conn.—All.—La.—Up.Mo.  
 †*Ludwigia alternifolia* L. fences, ditches I. 3 N.E.—Up.Mo. Fla.—La.  
*Ludwigia polycarpa* Sh. Pet. bottom III. 3 Mich.—Oreg. Ky.—Sask.  
*Ludwigia palustris* Ell. ditches, swampy places V. 8 Atl.—Pacif. G.—54°  
 N.L.

**Lythraceæ.** In N. Am. 6 Gen. 13 Spec.

- Rotala ramosior* Koehne (*Ammannia humilis* Michx.) bottom IV. 3 Atl.—  
 Miss.—Or. G.—Can.  
*Ammannia coccinea* Rottb. (*A. latifolia* L. Mant.) bottom VI. 5 Oh.—La.—  
 Up.Mo. Cal.—Sonora.  
*Lythrum alatum* Ph. bottom VIII. 5 Mich.—Fla.—Sonora—Cal.  
*Cuphea viscosissima* Jacq. dry wood openings VIII. 4 Conn.—All.—La.—  
 Up.Miss.

**Cucurbitaceæ.** In N. Am. 11 Gen. 26 Spec.

- Seyos angulatus* L. bottom V. 3 Atl.—Miss. G.—Can.  
*Echinocystis lobata* T.Gr. bottom V. 8 W.N.E.—Ky.—Up.Mo.—Sask.

**Ficoideæ.** In N. Am. 3 Gen. 4 Spec.

- Mollugo verticillata* L. roadsides, waste places, yards VIII. 8 N.E.—Cal.  
 Fla.—N.Mex.

**Umbelliferæ.** In N. Am. 45 Gen. 171 Spec.

- Sanicula marilandica* L. woods VI. 6 N.F.—Ga.—La.—R.Mts.—Or.  
*Eryncium yuccaefolium* Michx. dry prairie V. 5 N.J.—Up.Mo. Fla.—W.  
 Tex.  
*Heracleum lanatum* Michx. banks, copses III. 5 N.E.—All. (N.Ca.)—N.Mex.  
 Cal.—Sitka—Huds.—58°N.L.  
*Arhemora rigida* D.C. springy places III. 4 N.Y.—Fla.—Miss.  
*Archangelica atropurpurea* Hoffm. springy places II. 5 N.E.—Up.Miss.  
*Thaspium barbinode* Nutt. banks I. 4 N.E.—Fla.—Up.Miss.  
*Thaspium aureum* Nutt. woods V. 5 Atl.—Miss. G.—Can.  
*Thaspium trifoliatum* Gr. woods V. 5 Atl.—Miss.—R.Mts. G.—Sask.  
*Pimpinella integerrima* Benth Hook (*Zizia* D.C.) wooded hillsides V. 5  
 N.E.—Up.Miss.—La.  
*Cicuta maculata* L. swamps V. 5 Atl.—Pacif. G.—Sask.  
*Cicuta bulbifera* L. swamps II. 5 N.E.—Up.Miss.  
*Sium cicutæfolium* Gm. swamps V. 5 Atl.—Pacif. G.—Hudson's Bay.  
*Berula angustifolia* Koch. springs, creeks II. 7 Mass.—Pacif. (Sonora.—  
 Oreg).  
*Cryptotaemia Canadensis* D.C. woods IV. 5 N.E.—All.—La.—Up.Mo.  
*Cherophyllum procumbens* Lam. woods V. 5 N.J.—All.—La.—Up.Miss.  
*Osmorrhiza brevistylis* D.C. woods II. 4 N.E.—N.Ca.—Cal.—Sitka.  
*Osmorrhiza longistylis* D.C. woods II. 3 N.E.—Or. La.—Sask.

**Araliaceæ.** In N. Am. 2 Gen. 9 Spec.

- Aralia racemosa* L. woods V. 3 N.E.—All. (Ga.)—R.Mts.—Sask.  
*Aralia nudicaulis* L. woods III. 3 Labrador—All. (N.Ca.)—R.Mts.—64°N.L.  
*Aralia quinquefolia* Gr. woods III. 4 N.E.—All.—La.—Up.Miss.

**Cornaceæ.** In N. Am. 3 Gen. 29 Spec.

- †*Cornus circinata* L. woods I. 1 Can.—All. (Va.)—Ill.  
*Cornus sericea* L. woods, copses III. 4 Atl.—Miss. G.—Can.  
*Cornus stolonifera* Michx. bottom woods II. 3 N.E.—N.Mex.—Alaska—Huds.—69°N.L.  
*Cornus asperifolia* Michx. bottom woods V. 5 Fla.—S.Ca. Ky. Ill.—La.  
*Cornus paniculata* L'Her. woods V. 3 N.E.—Up.Miss. N.Ca.—La.  
*Cornus alternifolia* L. woods IV. 3 N.E.—Fla.—Up.Miss.

**Caprifoliaceæ.** In N. Am. 8 Gen. 47 Spec.

- Lonicera flava* L. rocky banks II. 3 N.Y.—All. (Ga.)—Up.Miss.  
 †*Lonicera parviflora* Lam. rocky banks I. 1 N.E.—All. (N.Ca.)—R.Mts.—Huds.  
*Triosteum perfoliatum* L. woods IV. 4 N.E.—All. (Ga.)—Up.Miss.  
*Sambucus canadensis* L. bottom VII. 5 Atl.—R.Mts. G.—Sask.  
*Viburnum Lentago* L. banks, hillsides III. 3 N.E.—All. (Ga.)—Miss.—Sask.  
*Viburnum prunifolium* L. copses III. 3 Conn.—Up Miss. G.—Can.  
*Viburnum dentatum* L. wooded hillsides I. 2 Vt.—N.J.—Ky.—Wisc.  
*Viburnum opulus* L. wooded hillsides I. 2 Vt.—R.Mts.—Arct.

**Rubiaceæ.** In N. Am. 26 Gen. 82 Spec.

- Galium Aparine* L. bottom, copses IV. 5 N.E.—Sonora—Alaska.  
*Galium concinnum* T.Gr. dry woods V. 8 All. (Pa.—Va.)—Up.Miss.  
*Galium trifidum* L. moist woods V. 8 Atl.—Pacif.—Alaska G.—68°N.L.  
*Galium triflorum* Michx. shady woods IV. 5 Atl.—Pacif. G.—Greenland.  
*Galium circæzans* Michx. shady woods V. 5 Atl.—Miss. G.—Can.  
 †*Spermacoce glabra* Michx. banks I. 1 Fla.—Tex.—Ills.—Oh.  
*Cephalanthus occidentalis* L. bottom, swamps V. 8 Atl.—Tex.—Cal. G.—Can.

**Compositæ.** In Am. 221 Gen. 1557 Spec.**Vernoniaceæ.**

*Vernonia fasciculata* Michx. bottom VIII. 8 Oh. Ky.—Up.Mo. Fla.—La.

**Eupatoriaceæ.**

- Liatris cylindracea* Michx. dry woods and prairies, IV. 5 W.Can.—Up.Miss.—La.  
*Liatris scariosa* Willd. dry sandy soil V. 6 W.Can.—Fla.—Tex.—R.Mts.—Sask.  
*Liatris pycnostachya* Michx. dry prairie V. 5 Ill.—La.—Tex.  
*Kuhnia eupatorioides* L. dry woods and prairies VIII 8 N.J.—R.Mts. Fla.—N.Mex.  
*Eupatorium purpureum* L. bottom, copses VI. 6 Atl.—Up.Mo. R.Mts. G.—Can.  
*Eupatorium altissimum* L. dry copses III. 4 All.—La.—Up.Mo.  
*Eupatorium sessilifolium* L. copses II. 3 N.E.—All. (Ga.)—Up.Miss.  
*Eupatorium perfoliatum* L. bottom V. 5 Atl.—Up.Mo. G.—Can.  
*Eupatorium serotinum* Michx. bottom VII. 9 N.Ca.—Up.Mo. Fla.—Tex.  
*Eupatorium ageratoides* L. shady wooded hillsides VI. 6 Atl.—Up.Mo. G.—Can.

**Asteroidæ.**

- Aster corymbosus* Ait. woods II. 3 N.E.—All. (Ga.)—Up.Miss.  
*Aster sericeus* Vent. dry, gravelly hillsides VI. 6 Oh.—Up.Mo.—All. (N. Ca.)—La.—Tex.  
*Aster levis* L. woods and dry hillsides V. 5 N.E.—All.—La.—N.Mx.—Sask.  
*Aster azureus* Lindl. copses, dry prairies V. 4 Oh. Mich.—Up.Mo. All. (Ga.)—La.  
*Aster Shortii* Boot wood VI. 6 Oh.—Up. Miss. All. (Ga.)—La.  
*Aster Drummondii* Lindl. woods, copses VI. 6 Oh.—Miss. Ga.—Can.  
*Aster cordifolius* L. woods VI. 6 N. E.—La.—Up.Miss.  
*Aster sagittifolius* Willd. woods VI. 6 Atl.—Up.Mo. W.Tex. G.—Can.  
*Aster ericoides* L. sandy soil, prairies II. 4 Conn.—Wisc. Fla.—La.—R.Mts.  
*Aster multiflorus* Ait. sandy soil, prairies VII. 8 Atl.—Mex.—Alaska G.—Arct.  
*Aster Tradescanti* L. fields, banks, etc. V. 3 N.E.—La.—Up.Miss.  
*Aster diffusus* Ait.\* fields, copses X. 10 Atl.—Up.Mo. G.—Can.  
*Aster paniculatus* Lam. bottom VI. 8 Atl.—N.Mex.—Or. G.—Can.  
*Aster salicifolius* Ait. bottom II. 4 N.E.—W.Tex.—Can.  
*Aster junceus* Ait. bottom II. 4 Oh.—Cal.—Arct.  
*Aster Novi-Belgii* L. bottom III. 8 Atl.—N.Mex.—Or.  
*Aster puniceus* L. bottom V. 8 N.E.—Miss. Fla.—N.Mex. G.—Huds.  
*Aster prenanthoides* Muhl. bottom I. 3 N.Y.—All. (N.Ca.)—Up.Miss.  
*Aster oblongifolius* Nutt. dry gravelly hillsides III. 5 Pa. Va.—N.Mex.  
*Aster amethystinus* Nutt. bottom I. 2 Mass.—Ill. Wisc.  
*Aster Novæ Angliæ* L. copses, fences VI. 5 N.E.—All. (Ga.)—Up.Miss.—R.Mts.  
*Aster anomalus* Engelm. wood openings III. 4 Up.Miss.  
*Aster umbellatus* Mill. (*Diplopappus umbellatus* and *amygdalinus* T.Gr.) springy places in woods II. 4 N.F.—All.—Up.Miss.  
*Aster infirmus* Michx. (*Diplopappus cornifolius* T.Gr.) moist woods I. 3 N.E.—All.—La.—Up.Miss.  
*Aster linariifolius* L. (*Diplopappus linariifolius* Hook.) sandy hills II. 5 Atl.—Miss. G.—Can.  
*Erigeron canadensis* L. waste places X. 10 Atl.—Pacif. G.—Sask.  
*Erigeron divaricatus* Michx. sandy soil II. 5 Ky. Ill.—La.—W.Tex.  
*Erigeron bellidifolius* Muhl. copses, hillsides, V. 5 N.E.—All.—La.—64° N.L.  
*Erigeron philadelphicus* L. banks, moist places, V. 5 Atl.—Pacif. G.—Arct.  
*Erigeron annuus* Pers. fields, waste places VII. 5 N.E.—Ky.—Up.Mo.  
*Erigeron strigosus* Muhl. fields, wood openings VI. 5 Atl.—Pacif. G.—Sask.  
*Boltonia asteroides* L'Her. (including *B. glastifolia* L'Her.) bottom V. 7 W. Can.—Up.Miss.—Fla.—La.  
*Solidago latifolia* L. shady woods V. 5 N.E.—All. (Ga.)—Up. Miss.  
*Solidago speciosa* Nutt. copses V. 4 Atl.—Tex. Up.Mo. G.—Can.  
*Solidago rigida* L. dry hillsides VI. 5 Conn. All. (N.Ca.)—Tex.—R.Mts.—Sask.  
*Solidago Ohioensis* Ridd. swamps II. 5 W.N.Y.—Ill.  
*Solidago Ridellii* Frank swamps III. 5 Oh.—Up.Miss.  
*Solidago neglecta* T.Gr. swamps II. 5 N.E.—Up.Miss.  
*Solidago patula* Muhl. springy places III. 4 Atl.—Miss. G.—Can.

\*There is no genus, the species of which are more subject to changes in nomenclature and so difficult to limitate, than the genus *Aster*, particularly the sections *dumosi* and *salicifolii* of Torr. & Gr. Gray in his new "Synoptical Flora" of North America does unite *A. simplex* and *A. tinuifolius* Nees (partim) under the name *A. paniculatus* Lam. *A. carneus* is partly put under *A. salicifolius* Nees, *A. æstivus* Gr. under *A. junceus* Ait., *A. miser* L. ? is *A. diffusus* Ait. The genus *Diplopappus* is re-united with *Aster*.

- Solidago arguta* Ait. copses V. 5 N.E.—All. (S.Ca.)—Miss.—Huds.  
*Solidago ulmifolia* Muhl. woods VI. 6 N.Y.—All.—Up.Mo.  
*Solidago nemoralis* Ait. dry wood openings VI. 6 Atl.—R.Mts. W. Tex. G.—Sask.  
*Solidago missouriensis* Nutt. dry praries III. 5 Up.Miss.—R.Mts. La.—Assiniboin.  
*Solidago canadensis* L. copses, fence rows X. 8 Atl.—N.Mex. G.—Subaret.  
*Solidago serotina* Ait. var. *gigantea* banks, copses III. 5 Atl.—Or. G.—Sask.  
*Solidago tenuifolia* Ph. banks II. 3 Atl.—Up.Mo. G.—Can.  
*Solidago lanceolata* L. banks, bottom V. 5 Atl.—R.Mts. G.—Huds.  
*Chrysopsis villosa* Nutt. dry prairie III. 5 Ill. Ky. Ala.—N.Mex.—Or.—Sask.

### Senecioideæ.

- Polymnia canadensis* L. woods III. 3 Can.—All.(N.Ca.)—Up.Miss.  
*Silphium laciniatum* L. dry prarie V. 5 Oh.—Up. Mo. Ala.—Tex.  
*Silphium terebinthinaceum* L. dry prairie V. 5 Mich. Oh. Up.Miss.—W. Ga.  
*Silphium integrifolium* Michx. dry prairie III. 3 W.Ga.—Up.Mo.  
*Silphium perfoliatum* L. copses III. 3 Mich.—Up.Mo.—La.—Ga.  
*Parthenium integrifolium* L. dry prairie, wood openings III. 2 All.—Up. Miss.—Tex.  
*Ambrosia trifida* L. bottom, fence-rows, fields III. 7 Atl.—Up.Mo. G.—Can.  
*Ambrosia artemisiæfolia* L. bottom, waste places X. 10 Atl.—Pacif. G.—Sask.  
*Ambrosia psilostachya* D.C. sandy soil II. 5 Ill.—Tex.—Cal.  
†*Ambrosia bidentata* Michx. prairie I. 1 Up.—Miss.—La.—Tex.  
*Xanthium canadense* Mill. bottom X. 10 Up.Miss.—Sask.—Cal.—Tex.  
*Eclipta alba* Hassk bottom III. 5 Pa.—Up.Mo.—Or.—Fla.—Tex.  
*Heliopsis lævis* Pers. copses IV. 5 Atl.—Up.Mo.—N.Mex. G.—Sask.  
*Echinacea purpurea* Moench. copses IV. 4 All.—Up.Mo.  
*Echinacea angustifolia* D.C. prairies V. 6 Ill.—Up.Mo. Ala.—Tex.  
*Rudbeckia laciniata* L. bottom VIII. 8 Atl.—N.Mex.G.—Can.  
*Rudbeckia tomentosa* Ph. prairie III. 5 Up.Miss.—La.  
*Rudbeckia triloba* L. woods V. 5 Pa.—W.Fla.—Miss.  
*Rudbeckia hirta* L. dry prairie, hillsides V. 7 W.N.Y.—Up.Miss. Fla.—La.  
*Lepachys pinnata* T.Gr. prairie, hillsides V. 4 W.N.Y.—Up.Miss. Fla.—La.  
*Helianthus rigidus* Desf. prairie V. 5 Mich. W.Ga.—N.Mex.—Sask.  
*Helianthus laetiflorus* Pers. prairie I. 4 Oh. W.Ga.—Up.Miss.  
*Helianthus occidentalis* Ridd. prairie V. 5 Oh.—All. (N.Ca.)—Miss.  
*Helianthus giganteus* L. copses, bottom II. 5 N.E.—All.—Miss.—Sask.  
*Helianthus grosseserratus* Martens copses, fields, VIII. 7 Oh.—Up. Miss. La.—N.Mex.  
*Helianthus strumosus* L. banks copses VII. 5 Atl.—Up.Mo.G.—Can.  
*Helianthus trachelifolius* Wild. copses II. 4 Pa.—Up.Mo.  
*Helianthus divaricatus* L. copses V. 5.—Fla.—La.—Can. Sask.  
*Helianthus decapetalus* L. copses III. 5 N.E.—All.(Ga.)—Miss.  
*Helianthus coronicoides* Lam. copses fence rows V. 5 All.—Up.Mo.  
*Helianthus hirsutus* Raf. copses I. 2 Oh.—Ga.—Tex. Wisc.  
*Verbesina helianthoides* Benth. Hook. copses I. 2 Oh.—W.Ga.—Up.Mo.  
*Actinomeris squarrosa* Nutt. copses V. 5 All.—Up.Mo.  
*Coreopsis aristata* Michx. swamps VIII. 8 Oh.—Wisc.—La.  
*Coreopsis tripteris* L. copses, banks V. 3 Pa.—Fla.—La.—Up.Miss.  
*Coreopsis palmata* Nutt. prairie, hillsides V. 4 La. W.Tex.—Wisc. Lake Winnipeg.

- Coreopsis lanceolata* L. prairie II. 4 W.Can.—Ill. Fla.—La.  
*Bidens frondosa* L. waste places: bottom, VIII. 5 Atl.—Up.Mo. G.—Can.—Or.  
*Bidens connata* Muhl. low banks V. 5 N.E.—All. (Ga.)—Up.Mo.  
*Bidens chrysanthemoides* Michx. swamps, banks VIII. 8 Atl.—Pacif.Gulf Can.  
*Dysodia chrysanthemoides* Lag. waste places, roadsides VI. 8 Up.Miss.—La. Up.Mo.—Mex.  
*Helenium auctumnale* L. bottom X. 6 Atl.—N.Mex.—Ore. G.—Subarct.  
*Achillea millefolium* L. prairies, open roads V. 3 Atl.—Pacif. G.—Arct.  
*Artemisia caudata* Michx. prairie IV. 5 N.E.—Up. Mo. Sask.—Tex.  
*Artemisia ludoviciana* Nutt. banks II. 2 Pacif.—Ill.—Sask.  
*Artemisia biennis* Willd. wastes places IV. 6 Pacif.—Tenn.—Mackenzie R.  
*Gnaphalium polycephalum* Michx. dry prairie, wood openings VI. 5 Atl.—Mex. G.—Can.  
†*Gnaphalium purpureum* L. sandy soil I. 1 Atl.—Pacif. G.—Can.  
*Antennaria plantaginifolia* Hook. open woods, hillsides VI. 5 Atl.—Pacif. G.—Huds.  
*Erechtites hieracifolia* Raf. waste places VI. 4 Atl.—Up.Mo. G.—Sask.  
*Cacalia suaveolens* L. bottom I. 3 Conn.—Ill. All.—W.Fla.  
*Cacalia reniformis* Muhl. woods II. 3 Pa.—N.Ca.—Up.Miss.  
*Cacalia atriplicifolia* L. bottom V. 5 W. Can.—Ill.—Fla.  
*Cacalia tuberosa* Nutt. prairie II. 3 W.Can.—Ala. Wisc.  
*Senecio aureus* L. wood, hillsides V. 5 N.F.—Fla.—Tex.—Or.

### Cynareæ.

- Cnicus altissimus* Willd. copses, fields IV. 3 N.Y.—Fla.—Tex.—Wisc.  
*Cnicus altissimus* var *discolor* Gr. copses, roadsides V. 4. Can.—Ga.—Ill.  
*Cnicus muticus* Ph. bottom, springy places III. 3 N.F.—Fla.—La.—Sask.  
*Cnicus pumilus* Torr. prairie V. 4 N.E.—U.Miss.

### Cichoriaceæ.

- Krigia amplexicaulis* Nutt. (*Cynthia virginica* Don) open woods V. 3 N.Y.—Colorado. Ga.—Minnesota.  
*Hieracium scabrum* Michx. open woods III. 3 N.E.Can.—Ga.—Up.Miss.  
*Hieracium longipilum* Torr. prairies V. 3 Mich.—Ark.—W.Tex.—Up.Mo.  
*Prenanthes alba* L. (*Nabalus* Hook) shady hillsides V. 4 N.F.—All.—U.Miss.  
*Prenanthes aspera* Michx. dry prairie III. 3 Oh.—La.—Up. Miss.  
*Prenanthes crepidinea* Michx. bottom, rich soil II. 3 W.N.Y.—Ill.—Ky.  
*Prenanthes racemosa* Michx. wet prairie III. 3 N.E.Can.—Up.Miss.—Sask. R.Mts.  
*Troximon cuspidatum* Ph. prairie, hillsides II. 3 Ill.Wisc.—R.Mts.  
*Taraxacum officinale* Weber open wood, yards V. 7 N.E.—R.Mts. Ore.—Arct.  
*Lactuca canadensis* L. copses, roadsides V. 3 Atl.—N.Mex. G.—Sask.  
*Lactuca integrifolia* Big. open ground II. 3 N.E.—Ga.—Ill.  
*Lactuca hirsuta* Muhl. wooded hillsides III. 4 N.E.—Up.Miss.—Tex.  
*Lactuca floridana* Gaertn. (*Mulgedium* DC.) copses, wooded hillsides V. 3 Pa.—Ill. Fla.—Tex.  
*Lactuca acuminata* Gr. copses, wooded hillsides II. 2 N.Y.—Fla.—Ill.

### Lobeliaceæ. In N. Am. 5 Gen. 29 Spec.

- Lobelia cardinalis*\* L. bottom IV. 6 Atl.—Up.Mo. G.—Can.  
*Lobelia syphilitica* L. bottom VI. 4 N.E.—Atl.—La.—R.Mts.

\*A single hybrid of *Lobelia cardinalis* and *syphilitica* was found.

- Lobelia leptostachys* A. D. C. dry open woods V. 4 Ill.—Up. Mo. S. Ca.—Tex.  
*Lobelia inflata* L. woods V. 4 N. E.—All.—La.—Up. Miss.  
*Lobelia spicata* Lam. dry prairie, open woods II. 3 N. E.—All.—La. Up. Mo.  
*Lobelia kalmii* L. swamps, wet banks III. 7 N. E.—La.—Ill.

**Campanulaceæ.** In N. Am. 4 Gen. 18 Spec.

- Campanula aparinoides* Ph. moist grassy plains III. 5 N. E.—La.—Up. Miss.  
*Campanula americana* L. bottom, copses V. 4 Atl.—Miss. G.—Can.  
*Specularia perfoliata* A. D. C. dry hillsides VI. 6 Atl.—Pacif. G.—Can.

**Ericaceæ.** In N. Am. 34 Gen. 131 Spec.

- Vaccinium vacillans* Sol. wooded hillsides I. 6 N. E.—S. Ca.—Ga.  
*Gaylussacia resinosa*\*\* T. Gr. wood I. 2 N. E.—Atl. (Ga.)—Up. Miss.  
*Arctostaphylos uva ursi* Spr. wooded hillsides I. 4 N. J.—R. Mts. Cal.—Arct.  
*Monotropa uniflora* L. woods III. 2 Atl.—Or. G.—Can.

**Ebenaceæ.** In N. Am. 1 Gen. 2 Spec.

- Diospyros virginiana* L. woods along river banks II. 4 R. I.—Kas.—Fla.—Tex.

**Primulaceæ.** In N. Am. 11 Gen. 36 Spec.

- Androsace occidentalis* Ph. sandy hillsides, banks VI. 6 Ill.—Ark.—R. Mts.—N. Mex.  
*Dodecatheon meadia* L. open woods II. 3 Pa.—N. Ca.—La.—Cal.—Alaska.  
*Steironema ciliatum* Raf. (*Lysimachia* L.) wood bottom V. 5 N. E.—La.—Up. Mo.  
*Steironema lanceolatum* Gr. bottom V. 6 N. E.—Up. Miss.  
*Steironema longifolium* Gr. wet prairie III. 4 Pa.—S. Ca.—Up. Miss.  
*Lysimachia thyrsoiflora* L. swamps II. 3 Pa.—Up. Miss.—Subarct.  
*Samolus valerandi* L. var. *americanus* Gr. bottom IV. 5 Atl.—Mex.—Or. G.—Can.

**Oleaceæ.** In N. Am. 6 Gen. 29 Spec.

- Fraxinus americana* L. bottom, hillsides IV. 4 N. E.—Up. Mo. Sask.—Fla.—Tex.  
*Fraxinus pubescens* Lam. bottoms II. 2 N. Br.—Minn. Fla.—Ala.  
*Fraxinus viridis* Michx. f. bottom hillsides VI. 5 N. E.—Sask. Fla.—Ariz.  
*Fraxinus quadrangulata* Michx. bottom III. 3 Mich.—Minn.—Ark.  
*Fraxinus sambucifolia* Lam. bottom III. 4 N. F.—Sask. Va.—Ark.

**Apocynaceæ.** In N. Am. 9 Gen. 21 Spec.

- Amsonia tabernaemontana* Walt. bottom VI. 4 Ill.—Tex.—Fla.—N. Ca.  
*Apocynum androsaemifolium* L. copses, hillsides IV. 3 Can.—Ga.—N. Mex.—Br. Columb.  
*Apocynum cannabinum* L. copses, banks V. 5 Atl.—Pacif. G.—Can.

**Asclepiadaceæ.** In N. Am. 17 Gen. 87 Spec.

- Asclepias tuberosa* L. dry open woods, hillsides, prairie VI. 5 Atl.—Mex.—R. Mts. G.—Can.  
*Asclepias purpurascens* L. copses, hillsides V. 3 N. E.—Up. Miss.—Tenn.  
*Asclepias incarnata* L. wet bottom, banks VI. 6 N. E.—All. (Ga.)—Up. Miss.—N. Mex.  
*Asclepias cornuti* Desn. fields, hillsides V. 5 Can.—Sask.—N. Ca.  
*Asclepias Sullivanti* Engelm. wet prairie II. 3 Oh.—N. Mex.  
*Asclepias obtusifolia* Michx. dry prairie IV. 3 N. E.—Up. Mo.—Fla.—Tex.  
*Asclepias Meadii* Torr. dry prairie II. 3 Up. Miss.

\*\**Gaylussacia* was found about fifteen miles southwest and may occur somewhat nearer.

*Asclepias phytolaccoides* Ph. shady banks IV. 3 N.E.—All.(Ga.)—Up.Miss.—La.

*Asclepias quadrifolia* L. wooded hillsides III. 3 Can.—N.Ca.—Up.Miss.—Ark.

*Asclepias verticillata* L. dry prairie V.S. Atl.—R.Mts.—Mex.G.—Can.

*Acerates longifolia* Ell. prairie II 2 Fla.—Tex. Oh.—Up. Miss.

*Acerates viridiflora* Ell. dry prairie hillsides V. 4 N.E.—Sask. Fla.—Tex.

**Gentianaceæ.** In N.Am. 13 Gen. 82 Spec.

*Gentiana quinqueflora* Lam. shady hillsides IV. 4 N.E.—Up.Miss.—Fla.—Tex.

*Gentiana alba* Muhl. copses III. 3 N.Y.—All. (Va.) Ky.—Up.Miss.

*Gentiana Andrewsii* Gris. bottom III. 4 N.E.—Sask.—All. (Ga.)

*Gentiana puberula* Michx. dry prairie, hillsides, II. 4 Oh. Ky.—Up.Miss.

†*Menyanthes trifoliata* L. swamps, I. 4 N.E.—Cal.—Alaska—Arct.

**Polemoniaceæ.** In N.Am. 5 Gen. 123 Spec.

*Phlox maculata* L. wooded hillsides I 2 Pa.—Up.Miss.—Fla.

*Phlox glaberrima* L. bottom, wet prairie II. 5 All. (Va.)—Up.Miss.—Fla.—La.

*Phlox pilosa* L. prairie, hillsides V. 5 N.J.—Sask. Fla.—Tex.

*Phlox divaricata* L. woods VII. 7 N.Y.—Up.Miss. Fla.—Ark.

*Phlox bifida* Beck sandy soil, hillsides II. 5 Up.Miss.

*Polemonium reptans* L. wooded hillsides VI. 5 N.Y.—Ala.—Up.Miss.—Or.?

**Hydrophyllaceæ.** In N.Am. 14 Gen. 115 Spec.

*Hydrophyllum virginicum* L. woods V. 3 N.E.—All. (S.Ca.)—W.T.—Alaska.

*Hydrophyllum appendiculatum* Michx. woods IV. 4 Can.—Wisc. All.—Mo.

*Ellisia nyctelea* L. shady woods VI. 8 Pa.—Va.—La.—Sask.

**Borraginaceæ.** In N.Am. 19 Gen. 123 Spec.

*Echinosperrum virginicum* Lehm. (*Cynoglossum Morisoni* DC.) woods VIII. 8 Can.—Alab.—Miss.

*Mertensia virginica* DC. bottom, shady hillsides V. 8 N.Y.—All. (S.Ca.)—Up.Miss.

*Myosotis verna* Nutt. dry soil II. 4 N.E.—Fla.—Tex.—Cal. Or.

*Lithospermum canescens* Lehm. prairie V. 3 Can.—Sask. Ala.—Ariz.

*Lithospermum hirtum* Lehm. dry open wood, prairie V. 5 Va.—Mich. Up. Miss. Fla.—Tex.

*Lithospermum angustifolium* Michx. (*L. longiflorum* Lehm.) prairie III. 6 Up.Miss.—Sask.—Ariz.

*Lithospermum latifolium* Michx. woods V. 3 Can.—Va.—Tenn. Up.Miss.

*Onosmodium carolinianum* DC. var. *molle* dry prairie, roadsides V. 6 Ill.—Sask.—Tex.

**Convolvulaceæ.** In N.Am. 8 Gen. 73 Spec.

*Jpomoea pandurata* Mey. bottom, fields V. 6 Can.—Fla.—Up.Miss. Tex.

*Jpomoea lacunosa* L. bottom IV. 5 Pa.—Ill. S.Ca.—Tex.

*Convolvulus sepium* L. bottom, copses III. 3 N.E.—Fla.—N.Mex.—Sask.

*Convolvulus spithameus* L. dry open woods IV. 3 Can.—Fla.—Up.Miss.

*Cuscuta tenuiflora* Engelm. bottom upon *Cephalanthus* V. 5 Pa.—Sask.—Ariz.

*Cuscuta inflexa* Engelm. bottom on shrubs V. 5 N.E.—Neb.—Ark.

*Cuscuta chlorocarpa* Engelm. bottom on *Polygonum*, etc. II. 3 Pa.—Up. Miss.—Ark.

*Cuscuta Gronovii* Willd. bottom on *Saururus*, etc. V. 8 Can.—Up.Miss. Fla.—Tex.



*Cuscuta compacta* Juss. bottom on shrubs V. 5 Can.—All. (Ala.) Up.Miss.—Tex.

*Cuscuta glomerata* Chois. bottom on compositae V. 5 Oh.—Up.Miss.—Tex.

**Solanaceæ.** In N. Am. 13 Gen. 68 Spec.

*Solanum nigrum* L. roadsides, fields, woods V. 3 Atl.—Pacif. G.—Can.

*Solanum carolinense* L. sandy soil, roadsides, fields VI. 5 Conn.—Up.Miss. Fla.—Tex.

*Physalis virginiana* Mill. (Ph. *viscosa* Gr.) sandy soil, fields, roadsides V. 4 Can.—Fla.—Tex.—Up.Miss.

*Physalis lanceolata* Michx. (Ph. *pennsylvanica* Gr.) sandy fields III. 4 Fla. N.Mex.—Sask.

*Datura tatula* L. waste places, roadsides X. 8 Atl.—Pacif. G.—Can.

**Scrophulariaceæ.** In N. Am. 37 Gen. 313 Spec.

*Scrophularia nodosa* L. banks, copses VI. 4 Atl.—Pacif. S.—Can

*Chelone glabra* L. bottom, springy places IV. 4 N.F.—Fla.—Ark.—Sask.

*Pentstemon pubescens* Sol. dry prairie, open woods VIII. 5 Can. Up.Miss. Fla.—Tex.

*Mimulus ringens* L. bottom VI. 5 N.E.—Up.Miss.—Tex.

*Mimulus Jamesii* T. Gr. springs I. 5 Mich. Up.Miss.—R.Mts.—Mex.

*Conoclea multifida* Benth. sandy banks VI. 6 Oh.—Ill.—Tex.

*Gratiola virginiana* L. bottom VI. 5 Atl.—Tex.—Or.

*Ilysanthes gratioides* Benth. bottom VI. 5 Atl.—Tex.—Or.

*Veronica virginica* L. woods V. 4 Can.—Sask. Ala.—Up.Mo.

*Veronica anagallis* L. ditches, brooks II. 5 Can.—Up.Miss. N.Mex.—Br.Col.

*Veronica americana* Schwein. ditches, brooks I. 4 N.E.—Ark.—Up.Miss. N.Mex. Cal.—Alaska.

*Veronica scutellata* L. bottom I. 5 N.E.—Up.Miss. Huds.—Br.Col. Cal.

*Veronica peregrina* L. wet fields, bottom X. 10 Atl.—Pacif. G.—Huds.

*Seymeria macrophylla* Nutt. bottom IV. 4 Oh.—Ky.—La.—Tex.

*Gerardia purpurea* L. bottom IV. 5 Can.—Fla.—Tex.—Up.Miss.

*Gerardia tenuifolia* Vahl. bottom, open woods V. 6 Atl.—R.Mts. G.—Can.

†*Gerardia aspera* Dougl. bottom I. 3 Up.Miss.—Sask.—W.Ark.

*Gerardia grandiflora* Benth. woods, copses IV. 5 Up.Miss.—Tenn.—Tex.

*Gerardia auriculata* Michx. fields, bottom II. 5 All. (Pa.—N.Ca.)—Up.Miss. Ark.

*Castilleja coccinea* Spr. dry open woods, copses VI. 6 All. Can.—Sask.—Tex.

*Pedicularis canadensis* L. prairie, hillsides V. 5 Can.—Sask. Fla. R.Mts.—Mex.

*Pedicularis lanceolata* Ph. swamps, springy places IV. 7 Conn.—Va.—Sask.

**Orobanchaceæ.** In N. Am. 4 Gen. 13 Spec.

*Aphyllon uniflorum* Gr. wooded hillsides II. 2 N.F.—Tex. Cal. Br.Columbia.

**Lentibulariaceæ.** In N. Am. 2 Gen. 19 Spec.

*Utricularia vulgaris* L. waters III. 5 N.F.—Sask.—Br.Col. All.—Tex.

†*Utricularia intermedia* Hayne shallow water I. 5 N.F.—Up.Miss.—60°N.L. Cal.

**Bignoniaceæ.** In N. Am. 4 Gen. 6 Spec.

*Tecoma radicans* Juss. bottom, woods III. 4 Pa.—Up.Miss. Fla.—Tex.

**Acanthaceæ.** In N.Am. 15 Gen. 39 Spec.

*Ruellia ciliosa* Ph. dry prairie VI. 5 Mich.—Up.Miss. Fla.—La.

*Ruellia strepens* L. woods II. 4 Pa.—Up.Miss. Fla.—Tex.

**Verbenaceæ.** In N. Am. 11 Gen. 35 Spec.

*Phryma leptostachya* L. woods VI. 3 Atl.—Miss. Ga.—Can.

\**Verbena urticifolia* L. bottom, roadsides VII. 7 Atl.—Mex. G.—Can.

*Verbena hastata* L. bottom, roadsides V. 5 Can.—Sask. Fla.—N. Mex.—Cal.

*Verbena stricta* Vent. dry prairie, roadsides × 8 Oh.—Up. Mo.—Tex. N. Mex.

*Verbena bracteosa* Michx. roadsides VII. 7 Wisc.—W. Fla.—Ariz.—Or.

*Lippia lanceolata* Michx. bottom, banks VI. 8 Pa.—Up. Miss. Fla.—Mex.—Cal.

**Labiataæ.** In N. Am. 37 Gen. 196 Spec.

*Isanthus cœruleus* Michx. sandy banks, hillsides IV. 7 Can.—Ga.—Tex., |  
Up. Miss.

*Teucrium canadense* L. bottom VI. 5 Atl.—Mex. G.—Can.

*Mentha canadensis* L. bottom, banks IV. 5 Atl.—Pacif. Can.—Sask.

*Lycopus virginicus* L. bottom IV. 5 Labr.—Fla.—Br. Columb.

*Lycopus sinuatus* Ell. bottom III. 4 Can.—Fla.—Tex.—Or.

*Pycnanthemum muticum* Pers. var. *pilosum* Gr. dry open woods V. 5 Oh.—  
Ill. Ark.

*Pycnanthemum linifolium* Ph. dry open woods II. 3 N. E.—Up. Miss. Fla.—  
Tex.

*Pycnanthemum lanceolatum* Ph. dry open woods, copses IV. 4 N. E.—Nebr.—  
Ga.

*Hedeoma pulegioides* Pers. open woods V. 8 N. E.—All. (S. Ca.)—Up. Miss.

*Monarda fistulosa* L. open woods, copses, hillsides V. 5 Can.—Fla. Ariz.—  
Br. Columb.

*Monarda clinopodia* L. shady woods II. 3 Can.—All. (Ga.)—Up. Miss.

*Blephilia hirsuta* Benth. woods V. 5 Can.—All. (Ga.)—Up. Miss.—Tex.

*Lophanthus nepetoides* Benth. copses IV. 3 Vt.—Wisc. All. (Ca.)—Tex.

*Lophanthus scrophulariæfolius* Benth. copses IV. 4 N. Y.—Up. Miss. N. Ca.—  
Ky.

*Scutellaria lateriflora* L. bottom VI. 6 Can.—Fla.—N. Mex.—Br. Columb.

*Scutellaria versicolor* Nutt. open woods V. 3 Pa.—Up. Miss. Fla.—Tex.

*Scutellaria parvula* Michx. gravelly banks, hillsides III. 6 N. E.—Up. Miss. Fla.—  
Tex.

*Scutellaria granulata* L. bottom II. 3 N. F.—All. (N. Ca.)—Cal.—60° N. L.

*Scutellaria nervosa* Ph. bottom I. 4 N. Y.—Va.—Up. Miss.

*Brunella vulgaris* L. bottom, woods VI. 4 N. F.—Fla.—Cal.—Alaska.

*Physostegia virginiana* Benth. bottom VI. 8 N. E.—Fla.—Tex.—65° N. L.

*Stachys palustris* L. bottom III. 3 N. F.—Pa.—R. Mts.

*Stachys aspera* Michx. bottom V. 5 Can.—Fla.—La.—Up. Miss.

**Plantaginaceæ.** In N. Am. 1 Gen. 14 Spec.

\*\**Plantago Rugelii* Decaisne fields, roadsides, woods VI. 8 Can. Vt.—Up. Miss. Ga.—Tex.

*Plantago cordata* Lam. banks of brooks I. 3 N. Y.—Up. Miss. Ala.—La.

*Plantago virginica* L. gravelly hillsides III. 5 N. E.—Up. Miss. Fla.—Tex.

**Aristolochiaceæ.** In N. Am. 2 Gen. 11 Spec.

*Asarum canadense* L. shady hillsides V. 4 N. E.—All. (N. Ca.)—Up. Mo.

*Aristolochia serpentaria* L. woods II. 2 Conn.—Fla.—Miss.

\*Several hybrids of *Verbena* occur: *V. stricta* × *urticifolia*, *V. stricta* × *bracteosa*, *V. hastata* × *urticifolia*.

\*\**Plantago Rugelii* was formerly taken for *Pl. major* an immigrated plant, which, so far, was not yet observed in our vicinity. Our species, which is indigenous, differs from *P. major* in the number of seeds (only 4 to 9) and the longer at the apex attenuated spike. *Plantago sparsiflora* Michx. probably does not grow in Illinois. A specimen from South Illinois I received under that name is nothing else than a depauperate *Plantago Rugelii*.

- Nyctaginaceæ.** In N. Am. 10 Gen. 50 Spec.  
*Oxybaphus nyctagineus* Sweet fence rows, banks V. 5 Up.Miss.—La.—N. Mex.—Up.Mo.
- Phytolaccaceæ.** In N. Am. 4 Gen. 5 Spec.  
*Phytolacca decandra* L. bottom, banks V. 3 N.E.—Up.Miss. Fla.—N. Mex.
- Chenopodiaceæ.** In N. Am. 17 Gen. 83 Spec.  
*Chenopodium album* L. bottom, fence rows X. 8 Atl.—Pacif.G.—Gr. Bear Lake.  
*Chenopodium hybridum* L. bottom V. 5 Atl.—Pacif.G.—Sask.
- Amarantaceæ.** In N. Am. 16 Gen. 46 Spec.  
*Moultelia tamariscina* Gr. bottom VIII. 8 Vt.—Up.Mo.—W. Tex.  
*Amarantus albus* L. waste places IV. 5 Atl.—N. Mex. R. Mts.—Or.  
*Amarantus retroflexus* L. bottom, waste places VIII. 8 Atl.—N. Mex.—R. Mts.  
*Amarantus blitoides* Wats. waste places V. 7; Mex.—R. Mts.—Up.Miss.
- Polygonaceæ.** In N. Am. 16 Gen. 197 Spec.  
*Polygonum pennsylvanicum* L. moist places VI. 6 Atl.—Mex.G.—Can.  
*Polygonum incarnatum* Ell. moist places III. 5 Atl.—Mex.G.—Can.  
 \**Polygonum hydropiper* L. moist places, ditches VI. 10 N.E.—Ariz.  
*Polygonum acre* H.B.K. bottom V. 3 Atl.—Mex.—Cal.G.—Can.  
*Polygonum hydropiperoides* Michx. moist places V. 6 Atl.—Mex.G.—Can.  
*Polygonum amphibium* L. waters, sloughs, banks X. 8 Atl.—Mex.G.—Or. Gr. Slave Lake.  
*Polygonum virginianum* L. woods V. 3 N.E.—Fla.—Up.Mo.  
*Polygonum aviculare* L. roadsides, yards X. 10 Atl.—Mex.G.—72°N.L.  
*Polygonum erectum* L. yards, roadsides V. 5 Atl.—Can.—Or.  
*Polygonum ramosissimum* Michx. bottom IV. 4 N.E.—Up.Mo.  
*Polygonum tenue* Michx. dry soil, hillsides V. 5 N.E.—All.—La.—Sask.—Or. Mex.  
*Polygonum sagittatum* L. bottom II. 8 Atl.—Miss.G.—Can.  
*Polygonum dumetorum* L. copses, banks V. 5 Atl.—Miss.—R. Mts.G.—Can.  
*Rumex orbiculatus* Gr. bottom, swamps II. 4 N.E.—Up.Miss.  
*Rumex britannica* L. banks, moist places IV. 5 N.Y.—W. Tex.  
*Rumex verticillatus* L. moist soil, banks V. 5 Atl.—Miss.G.—Can.
- Lauraceæ.** In N. Am. 5 Gen. 8 Spec.  
*Sassafras officinalis* Nees. woods V. 4 Atl.—Up.Mo. G.—Can.
- Thymeleaceæ.** In N. Am. 1 Gen. 2 Spec.  
*Dirca palustris* L. bottom, springy places II. 3. Atl.—Cal.G.—Can.
- Santalaceæ.** In N. Am. 3 Gen. 6 Spec.  
*Comandra umbellata* Nutt. dry hillsides, copses IV. 5 N.E.—All. (Ga.)—Mex.G.—Can.
- Saururaceæ.** In N. Am. 2 Gen. 2 Spec.  
*Saururus cernuus* L. swamps, springy places V. 6 Atl.—Miss. G.—Can.
- Ceratophyllaceæ.** In N. Am. 1 Gen. 2 Spec.  
*Ceratophyllum demersum* L. waters X. 10 Atl.—Pacif. G.—62°N.L.
- Callitrichaceæ.** In N. Am. 1 Gen. 6 Spec.  
*Callitriche heterophylla* Ph. waters III. 5 Atl.—Pacif. G.—71°N.L.

\**Polygonum hydropiper* may be indigenous as well as not. Porter, in Wheeler's Report, says: "Introduced?" De Candolle has it not in the list of introduced plants.

**Euphorbiaceæ.** In N. Am. 17 Gen. 164 Spec.

- Euphorbia maculata* L. roadsides, waste places, fields X. 10 Atl.—Cal. G.—Can.  
*Euphorbia hypericifolia* L. (Preslii Guss.) bottom fields VIII. 8 Atl.—N. Mex. G.—Can.  
*Euphorbia dentata* Michx. bottom III. 4 Pa.—Up. Miss. La.—Sonora.  
*Euphorbia heterophylla* L. banks, hillsides IV. 5 Up. Miss.—Mex.  
*Euphorbia corollata* L. prairies, hillsides VII. 7 N. Y.—Up. Mo. Fla.—Mex.  
*Euphorbia commutata* Engelm. sandy banks I. 3 Va.—Fla.—Up. Miss.  
 †*Euphorbia obtusata* Ph. woods I. 3 Vt.—S. Ca.—R. Mts.  
*Acalypha virginica* L. bottom, woods VII. 8 Atl.—N. Mex. G.—Can.  
*Croton glandulosus*\* L. sandy soil I. 3 Va.—Up. Miss. La.—W. Tex.

**Urticaceæ.** In N. Am. 13 Gen. 24 Spec.

- Ulmus fulva* Michx. woods, bottom V. 3 Can.—N. Fla.—Tex.—Up. Mo.  
*Ulmus americana* L. woods, bottom VIII. 8 N. F.—Fla.—R. Mts.—52° N. L.  
*Celtis occidentalis* L. woods, bottom III. 5 Can.—Up. Mo. Fla.—Tex.  
*Morus rubra* L. woods VI. 4 N. E.—Up. Mo. Fla.—Tex.  
*Urtica gracilis* Ait. bottom V. 4 N. E.—All.—N. Mex.—Cal. Or.  
*Laportea canadensis* Gaud. bottom V. 6 Atl.—Up. Mo. G.—Can.  
*Pilea pumila* Gr. shady woods V. 6 Atl.—Up. Mo. G.—Can.  
*Böhmertia cylindrica* Willd. bottom III. 4 Atl.—W. Tex. G.—Can.  
*Parietaria pennsylvanica* Muhl. shady woods III. 8 N. E.—All.—N. Mex.—Up. Mo.  
*Humulus lupulus* L. copses, bottom III. 4 N. E.—All.—N. Mex. R. Mts.—Sask.

**Platanaceæ.** In N. Am. 1 Gen. 3 Spec.

- Platanus occidentalis* L. woods, bottom VI. 5 N. E.—Up. Miss. Fla.—Tex.

**Juglandaceæ,** In N. Am. 2 Gen. 12 Spec.

- Juglans cinerea* L. woods V. 4 N. Br.—Up. Miss. All. (Ga.)—Ark.  
*Juglans nigra* L. woods V. 5 N. E.—Up. Miss. Fla.—Tex.  
*Carya olivae formis* Nutt. woods, bottom III. 3 Up. Miss. W. Ky.—La.—Tex.  
*Carya alba* Nutt. woods VIII. 8 Can.—Up. Miss. W. Fla.—Tex.  
*Carya tomentosa* Nutt. woods VI. 5 Can.—Up. Miss. Fla.—Tex.  
*Carya sulcata* Nutt. woods, bottom I. 3 Pa.—Up. Miss.—Ark.  
*Carya porcina*\*\* Nutt. woods I. 2 N. E.—Up. Miss. Fla.—Tex.  
*Carya amara* Nutt. woods VI. 6 N. E.—Up. Miss. Fla.—Tex.

**Cupuliferæ** In N. Am. 7 Gen. 46 Spec.

- Quercus alba* L. woods X. 8 N. E.—Up. Miss. Fla.—Tex. G.—46° N. L.  
*Quercus macrocarpa* Michx. woods, bottom V. 5 N. Br.—Up. Mo. N. Ca.—W. Tex.  
*Quercus bicolor* Willd. woods, bottom II. 5 N. E.—All. (Ga.)—Ark. Up. Miss.  
*Quercus prinoides* Willd. (*Qu. prinus acuminata* Michx.) woods IV. 4 N. E.—Up. Miss. All.—W. Tex.  
*Quercus imbricaria* Michx. woods IV. 4 Ta.—Up. Miss.—All.—(Ga.)  
*Quercus nigra* L. woods I. 2 N. Y.—Up. Miss. Fla.—W. Tex.  
*Quercus coccinea* Wang. woods VIII. 6 N. E.—Up. Miss. All.—Fla.  
*Quercus rubra* L. woods VI. 5 N. Scot.—Up. Miss. Fla.—Tex.

\*From the locality on which *Croton glandulosus* was found only a few years ago (railroad track) it may be concluded that it might be an immigrant from the southern part of Illinois.

\*\**Carya porcina*—No doubt single trees exist in the neighborhood, although I have not seen such; for amongst the nuts of the common hickory, brought to market, single nuts of the tree were observed.

*Quercus Leana* Nutt.\* (coccinea × imbricaria) I. 1 Oh. Ill.  
*Corylus americana* Walt. copses VIII. 10 Can.—Sask. Fla.—Tex.  
*Carpinus americana* Michx. woods V. 3 N.Scot.—Up.Miss. Fla.—Tex.  
*Ostrya virginica* Willd. woods V. 5 Can.—Up.Miss.—Winnipeg. Fla.—La.

**Salicaceæ.** In N. Am. 2 Gen. 68 Spec.

*Salix candida* Willd. swampy bottom I. 4. N.E.—Up.Miss.—Sask.  
 †*Salix tristis* Ait. dry hillsides I. 2. N.E.—All. (Ga.)—Up.Miss.  
*Salix humilis* Marsh. dry hillsides V. 5. N.E.—All. (Ga.)—Up.Miss.  
*Salix discolor* Muhl. banks bottom VII. 6. N.E.—N.Ca.—R.Mts.—Athabasca  
 R.—Labr.  
*Salix sericea* Marsh. (incl. *S. petiolata*) banks bottom IV. 4. N.E.—Up.Miss.  
 —Sask.  
*Salix cordata* Muhl. var. *angustata* bottom V. 5. N.E.—R.Mts.—Arct.  
*Salix nigra* Marsh. bottom X. 8 N.Br.—Cal. Fla.—Ariz.  
*Salix amygdaloides* Anders. bottom III. 4 N.Y.—Sask.—Or. Oh.—N.Mex.  
*Salix longifolia* Muhl. bottom low banks VIII. 8 N.E.—La.—Ariz.—Cal.—  
 Sask—66° N.L.  
*Salix myrtilloides* L. swampy bottom I. 4. N.E.—Up.Miss.—Arct.  
*Populus tremuloides* Michx. woods III. 5 N.F.—N.Mex. Cal.—Alaska—Huds.  
 69° N.L.  
*Populus grandidentata* Michx. wooded hillsides V. 5 N.Br.—Up.Miss.—All.  
 (N.Ca.)  
*Populus monilifera* Ait. bottom X. 8 Vt.—Fla.—N.Mex.—R.Mts.

**Coniferæ.** In N. Am. 15 Gen. 82 Spec.

*Juniperus virginiana* L. hillsides II. 4 N.Br.—Up.Miss. Fla.—Tex.—R.Mts.  
 67° N.L.  
 †*Thuja occidentalis*\*\* L. swamps I. 1 N.Br.—All (N.Ca.)—Up.Miss.—Huds.

**Araceæ.** In N. Am. 9 Gen. 11 Spec.

*Arisaema triphyllum* Torr. woods V. 4 Atl.—Up.Mo. G.—Can.  
*Arisaema Dracontium* Schott woods IV. 3 Atl.—Miss. G.—Can.  
*Peltandra virginica* Raf. swampy bottom II. 3 Atl.—Miss. G.—Can.  
*Symplocarpus foetidus* Salisb. swampy bottom III. 5. N.E.—N.Ca.—Up.  
 Miss.  
*Acorus calamus* L. swamp II, 6 Atl.—Miss. G.—Can.

**Lemnaceæ.** In N. Am. 2 Gen. 9 Spec.

*Lemna trisulca* L. waters III. 10 N.E.—N.Mex.—Cal.—55° N.L.  
*Lemna minor* L. waters V. 10 N.E.—Fla.—Mex.—Or.—60° N.L.  
*Lemna polyrrhiza* L. waters V. 10 Atl.—W.Tex. Nevada G.—55° N.L.  
*Wolfia columbiana* Karsten waters I. 10 N.E.—La.—Up.Miss.

**Typhaceæ.** In N. Am. 2 Gen. 5 Spec.

*Typha latifolia* L. swamps, slough, banks III. 5 Atl.—Pacif. G.—60° N.L.  
*Sparganium eurycarpum* Engelm. banks, ditches V. 5 N.E.—Pa.—Or.—Slave  
 Lake.

**Najadaceæ.** In N. Am. 7 Gen. 29. Spec.

*Najas flexilis* Rostk. Illinois R. II. 8 N.E.—Up.Miss. Fla.—W.Tex.  
*Zannichellia palustris* L. creeks I. 10 N.Y.—Sask.—Or. Cal. W. Fla.—  
 Mex.

\*The only tree unfortunately was cut last year: It stood on the bluff side near the western city limits.

\*\**Thuja occidentalis* is certainly extinct now in our flora, but in 1853 yet a large tree nearly two feet in diameter stood in a swamp at the foot of the eastern bluff. The locality and the age of the tree is against the belief that it was planted.

*Potamogeton natans* L. waters, sloughs and rivers V. 10 Atl.—Pacif.G.—60° N.L.

*Potamogeton pauciflorus* Ph. pools I. 5 N.E.—Ga.—N.Mex.—Up.Miss.

*Potamogeton pusillus* L. River I. 5 N.E.—R.Mts.—60° N.L.

*Potamogeton pectinatus* L. River V. 8 Atl.—Pacif.G.—55° N.L.

**Alismaceæ.** In N.Am. 6 Gen. 15 Spec.

*Triglochin palustre* L. bottom springy places III. 8 N.Y.—Up.Miss. R.Mts.—Alaska—Greenland.

*Triglochin maritimum* L. var. *elatum* bottom springy places II, 4 N.Y.—Cal Labr.—Alaska.

*Alisma Plantago* L. shallow waters V. 5 N.E.—Ga.—Cal.—55° N.L.

*Echinodorus rostratus* Engelm. low banks III. 5 Fla.—Ariz.—Up.Miss.

*Sagittaria variabilis* Engelm. low banks, pools VII. 7 Atl.—Pacif.G.—Can. N.F.

*Sagittaria calycina* Engelm. swamps II. 3 N.E.—Up.Miss.

*Sagittaria heterophylla* Ph. swamps, low banks II. 8 N.E.—Fla.—Miss.

**Hydrocharidaceæ.** In N.Am. 3 Gen. 3 Spec.

*Anacharis canadensis* Planch. creeks IV. 10 N.E.—N.Ca.—Up.Miss.—55° N.L.

*Valisneria spiralis* L. river IV. 10 Atl.—Miss.

**Orchidaceæ.** In N.Am. 24 Gen. 99 Spec.

*Orchis spectabilis* L. wooded hillsides III. 4 N.E.—All. (Ga.)—Up.Miss.

*Habenaria virescens* Spr. wooded hillsides II. 3 Atl.—Miss.G.—Can.

†*Habenaria hyperborea* R.Br. bottom springy places I. 2 N.E.—Or. Alaska—Greenland.

*Habenaria leucophæa* Gr. wet prairie I. 5 Oh.—Up.Mo.

*Spiranthes cernua* Rich. moist banks II. 3 Atl.—W.Tex.—Or.G.—Can.

*Spiranthes gracilis* Big. dry hillsides III. 3 Atl.—Miss.G.—Can.

†*Pogonia pendula* Lindl. woods I. 3 Atl.—Miss.G.—Can.

*Liparis Lœselii* Rich. swamps I. 4 N.E.—Up.Miss.—54° N.L.

*Liparis liliifolia* Rich. shady hillsides I. 1 N.E.—Up.Miss.

†*Corallorhiza odontorhiza* Nutt. woods I. 2 N.Y.—Fla.—R.Mts.

†*Aplectrum hiemale* Nutt. woods I. 3 N.E.—All.—Up.Mo.

*Calopogon pulchellus* R. Br. swamps I. 4 N.E.—Up.Miss. Fla.—La.

*Cypripedium candidum* Muhl. bottom II. 3 W.N.Y.—Up.Miss.

†*Cypripedium parviflorum* Salisb. bottom I. 2 N.Y.—All.—La.—Up.Miss.

*Cypripedium pubescens* Willd. woods V. 4 N.E.—All.—La.—R.Mts.

*Cypripedium spectabile* Sw. bottom, springy places II. 4 N.E.—N.Ca.—Miss.

**Amaryllidaceæ.** In N. Am. 5 Gen. 21 Spec.

*Hypoxis erecta* L. dry open woods, prairie V. 4 Atl.—R.Mts. G.—Can.

**Iridaceæ.** In N. Am. 3 Gen. 21 Spec.

*Iris versicolor* L. bottom, banks V. 5 Atl.—Up.Mo. G.—Can.

*Sisyrinchium Bermudiana* L. prairie, open woods V. 6 Atl.—Pacif. G.—Alaska.

**Dioscoreaceæ.** In N. Am. 1 Gen. 1 Spec.

*Dioscorea villosa* L. woods, copses IV. 4 Atl.—Miss. G.—Can.

**Smilacaceæ.** In N. Am. 1 Gen. 14 Spec.

*Smilax hispida* Muhl. moist copses, banks V. 5 W.N.Y.—La.—Up.Miss.

*Smilax herbacea* L. banks, bottom V. 4 Atl.—Up.Mo. G.—Can.

**Liliaceæ.** In N. Am. 50 Gen. 246 Spec.

- Trillium recurvatum* Beck. woods V. 5 Ind.—Up.Miss.  
*Trillium erectum* L. var. *album* woods I. 2 N.E.—N.Ca.—Up.Miss.  
*Trillium nivale* Ridd. woods IV. 4 Oh.—Up.Miss.  
*Uvularia grandiflora* Sm. woods V. 4 Vt.—All. (Ga.)—Up.Mo.  
*Smilacina racemosa* Desf. woods, copses V. 4 N.E.—All.—Cal. Or.—Sask.  
*Smilacina stellata* Desf. bottom, banks III. 3 N.E.—N.Mex. Cal.—Arct.  
*Polygonatum giganteum* Dietrich. woods V. 4 N.E.—La.—R.Mts.—Sask.  
*Lilium philadelphicum* L. prairie, open woods V. 5 N.E.—N.Ca.—Up.Mo.  
*Lilium superbum* L. copses, banks III. 3 N.E.—All. (Ga.)—La.—Up.Miss.  
*Erythronium albidum* Nutt. woods V. 5 N.Y.—Up.Miss.  
*Scilla Fraseri* Gr. prairie, banks V. 5 Oh.—La.—W.Tex.—Or.  
*Allium tricoccum* Ait. shady hillsides III. 4 N.E.—N.Ca.—Up.Miss.  
*Allium canadense* Kalm. wet prairie, banks V. 4 Atl.—Up.Mo. G.—Can.

**Juncaceæ.** In N. Am. 2 Gen. 61 Spec.

- Juncus tenuis* Willd. bottom, woods, roadsides, etc. VII. 8 N.E.—Fla.—Cal.  
*Juncus acuminatus* Michx. var. *legitimus* swamps V. 5 N.E.—Ga.—Ark.—Up.Miss.  
*Juncus canadensis* Gay. var. *brachycephalus* moist places V. 6 N.E.—Up.Miss.—N.F.—Huds.  
*Juncus nodosus* L. var. *megacephalus* swamps, banks IV. 4 N.F.—La.—Cal.

**Pontederiaceæ.** In N. Am. 3 Gen. 4 Spec.

- Pontederia cordata* L. shallow waters, banks II. 10 Atl.—Miss. G.—Can.  
*Schollera graminea* Willd. river, low banks VI. 8 N.E.—N.Ca.—Mex.

**Commelynaceæ.** In N. Am. 3 Gen. 12 Spec.

- Tradescantia virginica* L. prairie, copses V. 5 Atl.—W.Tex. G.—Can.  
*Commelina cayennensis*\* Rich. banks I. 3 Up.Miss.—La.

**Cyperaceæ.** In N. Am. 20 Gen. 448 Spec.

- Cyperus diandrus* Torr. bottom V. 10 N.E.—N.Ca.—W.Tex.—Up.Miss.  
*Cyperus erythrorhizus* Muhl. bottom V. 5 Pa.—Fla.—Ariz.—Up.Miss.  
*Cyperus inflexus* Muhl. sandy banks V. 8 Atl.—N.Mex.—Cal.—52°N.L.  
*Cyperus acuminatus* Torr. bottom III. 3 Ill.—Up.Mo.  
*Cyperus phymatodes* Muhl. bottom, sandy banks V. 8 Vt.—Fla.—Ariz.—Cal.  
*Cyperus strigosus* L. bottom V. 6 Atl.—N.Mex. G.—Can.  
*Cyperus Michauxianus* Schult. bottom V. 6 Atl.—Pacif. G.—Can.  
*Cyperus filiculmis* Vahl. dry prairie, hillsides V. 4 Atl.—W.Tex. G.—Can.  
†*Cyperus ovularis* Torr. sandy soil I. 2 N.Y.—Up.Miss. Fla.—W.Tex.  
*Dulichium spathaceum* Pers. bottom, wet banks II. 8 Atl.—Miss.—Nebr.  
*Hemicarpha subsquarrosa*\*\* Nees. sandy banks V. 6 N.Y.—Fla. N. Mex.—R.Mts.  
*Eleocharis obtusa* Schult. bottom V. 8 N.E.—Up.Miss. Fla.—W.Tex.  
*Eleocharis palustris* R. Br. swamps X. 10 Atl.—Pacif. G.—60°N.L.—Greenland.  
*Eleocharis compressa* Sull. bottom III. 6 N.Y.—Up.Mo.  
*Eleocharis Wolfii* Gr. bottom II. 6 Ill.  
*Eleocharis intermedia* Schult. swamps, sandy banks V. 5 N.Y.—Ga.—Miss.

\**Commelina cayennensis* is found on a single place in a wood. It is not uncommon in cultivation, and therefore it is doubtful whether it is indigenous or not. It is common in South Illinois and certainly an annual, although it may occasionally become perennial by striking roots from the joints.

\*\* Boeckeler (Linnæa 36:499) reunited this genus with *Scirpus*, and our species as *Scirpus micranthus* Vahl., the oldest name.

- Eleocharis tenuis* Schult. swamps II. 4 N.E.—N.Ca.—Up.Miss.—W.Tex.  
*Eleocharis acicularis* R. Br. low banks, shallow water VI. 10 Atl.—Pacif. G.—55°N.L.  
*Scirpus pungens* Vahl. banks V. 6 Atl.—N.Mex.—Cal. G.—Can.  
*Scirpus validus* Vahl. banks V. 6 Atl.—N.Mex.—Cal. G.—Can.  
*Scirpus Smithii* Gr. low banks, bottom II. 5 L. Ontario—Del.—Ill.  
*Scirpus atrovirens* Muhl. bottom V. 4 N.E.—Ky.—R.Mts.  
*Scirpus lineatus* Michx. bottom II. 4 N.E.—Up.Mo. Fla.—Tex.  
†*Eriophorum gracile* Koch. swamps I. 5 N.E.—Up.Mo. Fla.—Cal.—Arct.  
*Fimbristylis autumnalis* R. Sch. gravelly banks III. 6 N.E.—Up.Mo. Fla.—W.Tex.  
*Rhynchospora alba* Vahl. swamps II. 5 Atl.—Up.Mo.—Alaska G.—60°N.L.  
*Scleria triglomerata* Michx. wet prairie I. 3 Vt.—Fla.—Miss.  
*Scleria verticillata*\* Muhl. swamps I. 4 W.N.Y.—Fla.—Mich.—Up.Miss.  
*Carex polytrichoides* Muhl. bottom VI. 10 Atl.—R.Mts. G.—Sask.  
*Carex Stuedelii* Kth. woods IV. 8 N.Y.—Fla.—Miss.  
*Carex disticha* Huds. sandy prairie III. 3 N.Y.—R.Mts.—Cal. Ill.—Sask.  
*Carex teretiuscula* Good. moist soil V. 5 N.E.—Or.—53°N.L.  
*Carex vulpinoidea* Michx. bottom VI. 6 N.E.—S.Ca.—Up.Mo.  
*Carex crus corvi* Shuttl. wet prairie III. 3 Oh.—Wisc.—La.—W.Fla.  
*Carex stipata* Muhl. wet prairie III. 5 N.E.—Fla.—La.—Or.—54°N.L.  
*Carex conjuncta* Boot. bottom V. 5 N.E.—All. (Ga.)—Up.Miss.  
*Carex sparganioides* Muhl. wooded hillsides VI. 6 N.E.—All. (Ga.)—Up.Miss.  
*Carex cephaloidea* Boot. woods II. 4 N.Y.—Ill.  
*Carex cephalophora* Muhl. open woods V. 5 N.E.—Up.Miss. Fla.—W.Tex.  
*Carex rosea* Schk. woods VI. 6 N.E.—All. (Ga.)—Up.Mo.—Or.  
*Carex sterilis* Willd. bottom II. 5 N.E.—Fla.—Up.Miss.  
*Carex stellulata* Good. woods IV. 5 Atl.—Or.—Alaska G.—54° N.L.  
*Carex arida* Schw. Torr. bottom II. 6 Ky.—Up.Miss.—54° N.L.  
*Carex scoparia* Schk. bottom V. 6 N.E.—N.Ca.—Or.—54° N.L.  
*Carex lagopodioides* Schk. bottom V. 5 N.E.—S.Ca.—Cal.—54° N.L.  
*Carex cristata* Schw. bottom V. 7 Del. Pa.—Up.Mo.—54° N.L.  
*Carex straminea* Schk. bottom VI. 7 N.E.—Or. Fla.—W.Tex.  
*Carex stricta* Lam. swamp III. 7 N.E.—All. (N.Ca.)—N.Mex.—Arct.  
*Carex limosa* L. swamp I. 3 N.E.—R.Mts. Or.—G. Bear Lake.  
*Carex Buxbaumii* Wahl. dry prairie I. 3 N.E.—All. (Ga.)—Tex.—Cal.—Alaska.—Huds.  
*Carex Shortiana* Dew. banks, shady woods V. 5 Pa.—Va.—Up.Mo.  
*Carex tetanica* Schk. var. *Meadii* Dew. dry prairie III. 5 Oh. Ill. Wisc.  
*Carex granularis* Muhl. wooded hillsides VI. 6 Atl.—Miss.G.—Can.  
*Carex grisea* Wahl. wooded hillsides VI. 6 Atl.—Up.Mo.—Tex.G.—Cbn.  
*Carex Davisii* Schw. Torr. woods V. 5 N.E.—All. (Ga.)—Up.Mo.  
*Carex triceps* Michx. open woods III. 5 N.E.—Fla.—Miss.—Tex.  
*Carex digitalis* Willd. wooded hillsides I. 3 N.Y.—Ky.—Up.Miss.  
*Carex laxiflora* Lam. woods VI. 6 Atl.—Up.Mo.—Or.G.—54° N.L.  
*Carex oligocarpa* Schk. woods II. 3 N.E.—Ky.—Up.Miss.  
†*Carex Hitchcockiana* Dew. woods I. 2 N.E.—Ky.—Up.Miss.  
*Carex umbellata* Schk. dry hillsides I. 4 N.E.—Ill.—R.Mts.—Sask. La.—Ariz.  
*Carex pennsylvanica* Lam. woods VIII. 8 N.E.—All. (Ga.)—R.Mts.  
*Carex varia* Muhl. woods V. 5 N.E.—Up.Miss.  
†*Carex Richardsonii* R.Br. open woods I. 2 N.Y.—Up.Miss. 54° N.L.—N.W. Coast.  
*Carex pubescens* Muhl. moist woods V. 5 N.E.—Up.Miss.

\* This rare plant was found during the summer of 1887 by Mr. McDonald, the first time in Illinois.



- Carex filiformis* L. swamps III. 5 N.E.—Up.Mo.—54° N.L.  
*Carex lanuginosa* Michx. wet prairie V. 5 N.E.—Ky.—N.Mex.—Cal.—Mc-Kenzie.  
*Carex riparia* Curt. swamp I. 5 Fla. N.E.—Up.Miss.  
*Carex trichocarpa* Muhl. bottom II. 5 N.E.—Ga.—Up.Miss.  
*Carex comosa* Boot. swamp I. 4 N.E.—Up.Miss.  
*Carex histicrina* Willd. wet banks, bottom VII. 7 N.E.—Up.Miss. Ga.—N.Mex.  
*Carex tentaculata* Muhl. bottom VII. 6 Atl.—Miss.G.—Can.  
*Carex Grayi* Carey bottom V. 4 N.Y.—Up.Miss.  
*Carex lupulina* Muhl. bottom V. 5 Atl.—Miss.G.—Can.  
*Carex lupuliformis* Sartwell bottom I. 3 N.Y.—Del.—Ill.  
*Carex monile* Tuck. swamps II. 3 N.E.—Ky.—65° N.L.  
*Carex squarrosa* L. bottom I. 4 N.E.—All. (Ga.)—Up.Miss.  
*Carex longirostris* Torr. woods III. 5 N.E.—R.Mts.—54° N.L.

**Gramineæ.** In N. Am. 103 Gen. 615 Spec.

- Leersia oryzoides* Sw. banks V. 7 Atl.—Miss. G.—54° N.L.  
*Leersia virginica* Willd. bottom V. 5 Atl.—Miss. G.—Can.  
*Leersia lenticularis* Michx. bottom II. 4 Va.—Fl.—La.—Up.Miss.  
*Zizania aquatica* L. swamps, shallow waters IV. 8 Atl.—Miss. G.—Can.  
*Alopecurus geniculatus* var. *aristulatus* Michx. fields, waste places III. 3 N.E.—Fla.—Up.Miss.  
*Vilfa aspera* Beauv. sandy soil IV. 4 Atl.—Miss.  
*Vilfa vaginaeflora* Torr. sandy soil VI. 5 N.E.—N.Ca.—Ark.—Up.Miss.  
*Sporobolus heterolepis* Gr. dry hillsides V. 6 N.E.—Up.Miss.  
*Agrostis perennans* Tuck. bottom IV. 5 Atl.—Miss.  
*Agrostis scabra* Willd. dry prairies III. 5 N.E.—Cal.—Alaska Pa.—La.  
*Agrostis vulgaris* With. open woods V. 5 N.Y.—Ark.—R.Mts.—55° N.L.  
*Agrostis alba* L. bottom IV. 3 N.Y.—Cal.—Huds.  
*Cinna arundinacea* L. bottom, banks V. 5 Atl.—Miss. G.—55° N.L.  
*Muhlenbergia sobolifera* Gr. woods II. 3 Vt.—Up.Miss.  
†*Muhlenbergia glomerata* Trin. swamps I. 4 N.E.—Up.Miss.—Ark.—Sask.—Or.  
*Muhlenbergia mexicana* Trin. bottom V. 6 N.E.—N.Ca.—Ark.—Up.Miss.  
*Muhlenbergia silvatica* T. Gr. bottom III. 6 N.E.—Up.Miss.—W.Tex.—Nevada.  
*Muhlenbergia Willdenovii* Trin. woods II. 3 N.E.—All. (Ga.)—Up.Miss.  
*Muhlenbergia diffusa* Schrad. bottom VI. 8 Atl.—Cal. G.—Can.  
*Brachyelytrum aristatum* Beauv. bottom III. 4 Atl.—Miss.  
*Calamagrostis canadensis* Beauv. bottom II. 7 N.E.—All. (Ga.)—R.Mts.—Arct.  
*Oryzopsis melanocarpa* Muhl. sandy hillsides I. 4 N.E.—Up.Miss.  
*Stipa spartea* Trin. prairie V. 5 Ill.—N.Mich.—Up.Mo.—R.Mts.—Nevada.  
*Spartina cynosuroides* Willd. bottom V. 10 N.E.—Up.Mo.—Arct.  
*Bouteloua curtipendula* Gr. dry prairie VI. 6 N.Y.—Mex.  
*Tricuspis seslerioides* Torr. dry prairie IV. 5 N.Y.—Fla.—La.—Up.Miss.  
*Diarrhena americana* Beauv. shady woods IV. 4 Oh.—Up.Miss.—Ark.  
*Koeleria cristata* Torr. dry prairie V. 7 Pa.—Cal.—Or.—54° N.L.  
*Eatonia obtusata* Gr. dry prairie III. 5 Pa.—Fla.—Cal.—Or.  
*Eatonia pennsylvanica* Gr. woods V. 5 N.E.—All. (Ga.)—Up.Mo.  
*Melica mutica* Walt. copses, woods V. 4 W.Pa.—Fla.—R.Mts.  
*Glyzeria nervata* Trin. banks VI. 8 Atl.—Miss.  
*Glyzeria fluitans* R.Br. creeks III. 6 N.E.—All. (Ga.)—Miss.—54° N.L.

- Poa sylvestris* Gr. woods III. 5 Mich.—Ky.—Up.Miss.  
*Poa serotina* Ehrh. banks II. 4 N.E.—R.Mts.—Or.—Alaska.  
*Poa pratensis* L. prairies, cultivated ground V. 10 N.E.—Up.Mo.—72° N.L.  
 Kotzebue Sund—Greenland.  
*Poa compressa* L. dry soil V. 8 N.E.—Up.Miss.—54° N.L.  
*Poa annua* L. dry prairie, cultivated land V. 4 Atl.—Pacif.  
*Eragrostis reptans* Nees low sandy banks V. 10 Atl.—Up.Miss.  
*Eragrostis Frankii* Mey. sandy banks V. 8 Oh.—Up.Miss.  
*Eragrostis capillaris* Nees sandy soil, fields V. 8 Atl.—Miss.  
*Eragrostis pectinacea* Gr. var. *spectabilis* sandy soil V. 7. Mass.—Oh.—Fla.,  
 —Miss.  
*Festuca tenella* Willd. dry prairie V. 6. N.E.—Up.Mo. Fla.—Cal.  
*Festuca nutans* Willd. woods V. 5 N.E.—Fla.—Up.Mo.  
*Bromus Kalmii* Gr. woods IV. 4 N.E.—Cal.—Arct.  
*Bromus ciliatus* L. woods IV. 4 Atl.—Pacif. G.—Arct.  
*Phragmites communis* Trin. banks, swamps II. 6 Atl.—Pacif. G.—54° N.L.  
*Hordeum pratense* Huds. roadsides IV. 5 Oh.—La.—R.Mts.  
 \**Hordeum jubatum* L. fields I. 3 W.Can.—Up.Miss.—R.Mts.—Cal.  
*Elymus virginicus* L. woods IV. 4 Atl.—Up.Mo. G.—Can.  
*Elymus canadensis* L. prairie, copses III. 5 N.E.—Up.Mo.  
*Elymus strictus* Willd. var. *villosus* woods V. 4 N.E.—All.—Cal.  
*Gymnostichum Hystrix* Schreb. woods V. 3 N.E.—All. (Ga.)—Up.Miss.  
*Danthonia spicata* Beauv. dry open woods III. 6 Atl.—Miss.  
*Phalaris arundinacea* L. swamps II. 6 N.E.—Up.Miss.—Cal.—60° N.L.  
*Panicum anceps* Michx. moist places V. 5 N.J.—Up.Miss. Fla.—La.  
*Panicum proliferum* Lam. roadsides, moist places V. 6 Atl.—Miss.  
*Panicum capillare* L. sandy soil V. 7 Atl.—Cal. G.—Can.  
*Panicum autumnale* Bosc. sandy prairie I. 5 S.Ca.—Ill.  
*Panicum virgatum* L. banks, bottom V. 4 N.E.—Up.Mo. Fla.—N.Mex.  
*Panicum clandestinum* L. copses II. 4 N.E.—N.Ca.—Up.Mo.  
*Panicum latifolium* L. copses V. 4 N.E.—Up.Miss. Fla.—N.Mex.  
*Panicum scoparium* Lam. prairie III. 4 N.W.—Ga.—Miss.  
*Panicum dichotomum* L. open woods, prairie V. 7 N.E.—Cal. Fla.—W.Tex.  
*Panicum depauperatum* Muhl. dry prairie, copses III. 5 N.E.—N.Ca.—  
 Up.Miss.  
*Panicum crus Galli* L. bottom, fields VII. 7 N.E.—Fla.—Tex.—Cal.—Or.  
*Cenchrus tribuloides* L. bottom, cultivated land V. 5 N.E.—Fla.—Tex.—  
 Cal.—Up.Mo.  
*Andropogon furcatus* Muhl. prairie V. 5 N.E.—Up.Mo. Fla.—N.Mex.  
*Andropogon scoparius* Michx. sandy soil V. 7 N.E.—Up.Mo. Fla.—N.Mex.  
*Chrysopogon nutans* Benth. dry prairie V. 6 N.E.—Up.Mo. Fla.—N.Mex.

**Equisetaceæ.** In N. Am. 1 Gen. 13 Spec.

- Equisetum arvense* L. sandy soil, banks VI. 3 N.E.—N.Mex.—Cal.—Arct.  
 †*Equisetum palustre* L. bottom I. 5 N.Y.—Up.Miss.  
*Equisetum limosum* L. shallow waters VI. 4 N.E.—Up.Miss.  
*Equisetum laevigatum* A. Br. dry clay soil I. 3 N.Ca.—Ill.—Cal.  
*Equisetum hiemale* L. banks VI. 5 N.E.—N.Mex.—Cal.  
*Equisetum robustum* A. Br. banks V. 6 Oh.—N.Mex.—Or.  
*Equisetum variegatum* Schleich. banks II. 3 N.E.—R.Mts.—72° N.L.

**Filices.** In N. Am. 30 Gen. 146 Spec.

- Adiantum pedatum* L. woods VIII. 8 N.E.—N.Ca.—Cal.—Alaska.

\**Hordeum jubatum* is observed only since five years. When not overlooked before, as it is not common, then it may be that it recently immigrated from the Northwest.

- Pteris aquilina* L. woods V. 5 N.E.—Alaska Fla.—Ariz.  
*Asplenium angustifolium* Michx. woods II. 3 N.E.—All. (Ga.)—Ark.—Up.Mo.  
*Asplenium filixfoemina* Bernh. woods V. 5 Labr. N.E.—Fla.—Cal.—Alaska  
*Asplenium thelypteroides* Michx. woods III. 5 N.E.—All. (Ga.)—La.—Up.Miss.  
*Camptosorus rhizophyllus* Link. rocks II. 3 N.E.—All. (Ga.)—Wisc:  
*Phegopteris hexagonoptera* Feé. woods III. 5 Atl.—Miss.  
*Aspidium thelypteris* Sw. swamps V. 10 Atl.—Miss. G.—52°N.L.  
*Aspidium spinulosum* Sw. woods III, 4 N.F.—N.Ca.—Ark.—Or.—Alaska—Aret.  
*Aspidium acrostichoides* Sw. woods V. 5 Atl.—Miss.  
*Cystopteris bulbifera* Bernh. shaded rocks III. 5 N.E.—N.Ca.—Ark.—Up. Miss.  
*Cystopteris fragilis* Bernh. woods VII. 8 N.E.—N.Ca.—Cal.—Alaska—Greenland 72°N.L.  
*Onoclea sensibilis* L. woods III. 5 N.Br.—Fla. G.—Sask.  
†*Struthiopteris germanica* Willd. woods I. 1 N.E.—All. (Ga.)—Sask.  
†*Osmunda regalis* L. swampy bottom I. 2 Atl.—Miss. N.F.—Sask.  
*Osmunda claytoniana* L. woods V. 6 N.F.—All.(Ga.)—Ark.—Lake Superior.

**Ophioglossaceæ.** In N. Am. 2 Gen. 11 Spec.

- Botrychium virginicum* Sw. woods IV. 4 Atl.—Or.

**Lycopodiaceæ.** In N. Am. 3 Gen. 20 Spec.

- Selaginella apus* Spring. moist places near springs III. 5 Atl.—Miss.

**Hydropterides.** In N. Am. 4 Gen. 22 Spec.

- Azolla caroliniana* Willd. river, wet banks I. 10 Atl.—Miss.—Ariz.

**Musci.** In N. Am. 120 Gen. 896 Spec.

- Phascum cuspidatum* Schreb., old fields.  
*Pleuridium alternifolium* Brid., old fields.  
*Weisia viridula* Brid., old fields, roadsides.  
*Dicranella varia* Schpr., clay soil.  
*Dicranella heteromalla* Schpr., moist ground.  
*Dicranum scoparium* L., wooded hillsides.  
*Fissidens bryoides* Hdw., moist ground in woods.  
*Fissidens taxifolius* Hdw., on sandy soil in woods.  
*Fissidens adiantoides* Hdw., moist ground in woods.  
\**Fissidens subbasilaris* Hdw., on putrid trunks.  
*Leucobryum vulgare* Hampe, moist ground.  
*Ceratodon purpureus* Brid., on the ground in woods and fields.  
*Didymodon rubellus* Br. Sch., on sandy ground.

\*The species marked (\*) are not common with the Eastern Continent. *Fissidens grandifrons* Brid. and *Gymnostomum curvirostrum* Hedw., before not known in Illinois. I found in the canyon called Deer Park, on the Vermillion river, in LaSalle county in 1882.

A list of Illinois mosses, published in 1878 by Hall and Wolf in Bulletin II. of Illinois State Laboratory, contains 50 genera and 153 species. No doubt there will be found more, although the nature of the country, the little difference in elevation and soil, and the lack of coniferous forests is not favorable to moss growth.

A great number found by Wolf in Fulton county have not yet been observed around Peoria, but a greater part may occur. These are the following: *Ephemerum crass-inervium* Hampe, *Sphaerangium Schimperianum* Lesq., *Astonium utridulum* Schimp., *Bruchia flexuosa* C. Muell., *Weisia Wolfii* James, *Campylopus Leanus* Sull., *Dicranella rufescens* Schimp., *Dicranum flagellare* Hedw., *Fissidens obtusifolius* Wils., *Fissidens minutulus* Sull., *Conomitrium Julianum* Mort., *Uloa crispula* Brid., *Atrichum undulatum* Beauv., *Webera nutans* Hedw., *Webera albicans* Schimp., *Bryum pendulum* Schimp., *Bryum atropurpureum* Wahl., *Mnium affine* Bland., *Philonotis Muhlenbergii* Brid., *Disceium nudum* Brid., *Aphanorhema serrata* Sull., *Fontinalis bifloris* Sull., *Fontinalis disticha* Hook., *Fontinalis dalecarlica* Br. Eu., *Dichelyma capillaceum* Br. Eu., *Leskea Austinii* Sull., *Clasmatodon parvulus* Hampe, *Thelia Lescurii* Sull., *Fabronia gymnostoma* Sull. and Lesq., *Anacamptodon splachnoides* Brid., *Ptilasia denticulata* Schimp., *Cylindrotheclium compressum* Br. Eu., *Hypnum triquetrum* L., *Hypnum Sullivanii* Spruce., *Hypnum Boschi* Schwaegr., *Hypnum micans* var. *album* C. Muell., *Hypnum crista caestrens* L., *Hypnum dimorphum* Brid., *Hypnum acutum* Mitt.

- Leptotrichum pallidum* Hampe, clayey ground.  
*Leptotrichum tortile* C. Muell., clayey ground.  
*Desmatodon obtusifolius* Schpr., on sandy soil.  
*Barbula unguiculata* Hdw., clayey ground.  
*Barbula caespitosa* Schwaegr., on exposed roots of trees.  
*Grimmia conferta* Funk., on rocks.  
*Hedwigia ciliata* Ehrh., on rocks.  
 \**Drummondia clavellata* Hook., on bark of trees.  
 \**Orthotrichum strangulatum* Beauv., on bark of trees.  
*Physcomitrium pyriforme* Brid., on the ground.  
*Funaria hygrometrica* Sibth., on the ground.  
*Bartramia pomiformis* Hedw., on the ground in shady woods.  
*Leptobryum pyriforme* Schimp., on the ground.  
*Bryum intermedium* Brid., on clayey soil.  
*Bryum bimum* Schreb., on the ground in woods.  
*Bryum argenteum* L., on the ground around houses.  
*Bryum caespitosum* L., on the ground.  
*Bryum roseum* Schreb., in shady places.  
*Bryum uliginosum* Br. Sch., in woods.  
*Mnium cuspidatum* Hedw., in woods around trees.  
 \**Aulacomnium heterostichum* Br. Sch., in the shade of trees.  
*Timmia megapolitana* Hedw., on sandy soil.  
*Atrichum angustatum* Br. Sch., on the ground in woods.  
 \**Pogonatum brevicaulis* Beauv., on clayey soil.  
*Polytrichum juniperinum* Willd., on the ground in woods.  
*Polytrichum commune* L., on the ground in woods.  
 \**Leucodon julaceus* Sull., at the base of trees.  
 \**Thelia hirtella* Sull., at the base of trees.  
 \**Thelia asprella* Sull., at the base of trees.  
*Leskea polycarpa* Ehrh., at the base of trees.  
*Leskea obscura* Hedw., at the base of trees.  
*Anomodon rostratus* Schimp., on the ground in woods.  
*Anomodon obtusifolius* Br. Sch., on trunks of trees.  
*Anomodon attenuatus* Hueb., on trunks of trees.  
*Anomodon tristis* Cesati., on trunks of trees.  
*Platygyrium repens* Br. Sch., on the bark of decayed logs.  
*Pylaisia intricata* Br. Sch., on the bark of trees.  
*Pylaisia velutina* Br. Sch., on the bark of trees.  
*Homalothecium subcapillatum* Br. Eu., on the bark of trees.  
*Cylindrothecium cladorrhizans* Schimp., on old logs.  
 \**Cylindrothecium sedutrix* Sull., on old logs.  
 \**Climacium americanum* Brid., on the ground in woods.  
*Hypnum minutulum* Hedw., on decayed logs.  
 \**Hypnum gracile* Br. Sch., on decayed logs.  
*Hypnum delicatulum* L., on decayed logs.  
*Hypnum laetum* Brid., on exposed roots of trees.  
 \**Hypnum acuminatum* Beauv., on the ground in woods.  
*Hypnum salebrosum* Hoffm., on the ground in woods.  
*Hypnum rutabulum* L., on the ground in woods.  
*Hypnum rivulare* Br. Eu., on moist ground in woods.  
*Hypnum hians* Hedw., on the ground in woods.  
 \**Hypnum serrulatum* Hedw., on the ground in woods.  
 \**Hypnum deplanatum* Schpr., on the ground in woods.  
 \**Hypnum adnatum* Hedw., on boulders and trunks.

- Hypnum serpens* L., on the ground and rotten logs.  
*Hypnum radicale* Beauv., on the ground and rotten logs.  
*Hypnum orthocladum* Beauv., around springs.  
*Hypnum riparium* L., in swampy places.  
 \**Hypnum hispidulum* Brid., in dry woods on the ground or logs.  
*Hypnum chrysophyllum* Brid., in woods on the ground.  
*Hypnum aduncum* Hedw., in swamps.  
*Hypnum imponens* Hedw., on decayed logs.  
*Hypnum curvifolium* Hedw., on decayed logs.  
*Hypnum Haldanianum* Grev., in woods on the ground.  
*Hypnum Schreberi* Willd., in damp woods on the ground.

**Hepaticæ.** In N. America, 50 genera, 230 species.

The list of Illinois Hepaticæ by Wolf and Hall contains 44 species in 22 genera. There are seven species that are mentioned of Fulton County and may occur around Peoria, although not yet observed, viz: *Riccia Lescuriana* Aust., *Aneura pinguis* Dum., *Aneura multifida* Dum., *Madotheca porella* Nees., *Lophocolea Macouni* Aust., *Coleochila Taylori* Dum., *Blepharostoma trichophylla* Dum.

- \**Riccia Frostii* Aust., on moist ground.  
 \**Riccia lutescens* Schwein., on moist ground.  
*Riccia fluitans* L., in waters and moist ground.  
*Riccia natans* L., in water.  
*Marchantia polymorpha* L., on moist ground in woods.  
*Grimaldia barbifrons* Bisch., in woods between mosses.  
*Asterella hemisphaerica* Beauv., on moist ground.  
*Conocephalus conicus* Dum., on wet rocks, moist hillsides.  
 \**Fimbriaria tenella* Nees., on the ground in woods.  
*Anthoceros laevis* L., on wet boulders between mosses.  
 \**Notothylas orbicularis* Sull., on moist ground along creeks.  
 \**Frullania eboracensis* Gottsche., on the bark of trees.  
 \**Frullania virginica* Gottsche., on the bark of trees.  
 \**Frullania aeolotis* Nees., on decayed logs.  
*Madotheca platyphylla* Dum., on the bark of trees.  
*Radula complanata* Dum., on the bark of trees.  
*Blepharozia ciliaris* Dum., on old logs.  
*Trichocolea tomentella* Dum., in moist places in woods.  
*Lophocolea bidentata* Dum., between mosses in woods.  
*Lophocolea heterophylla* Nees., between mosses in woods.  
*Cephalozia bicuspidata* Dum., on rotten logs.  
*Cephalozia divaricata* Dum., on rotten logs.  
*Cephalozia curvifolia* Dum., on rotten logs.  
*Jungermannia Schraderi* Mart., on rotten logs.

The Lichens, Fungi and Algae of our flora are little studied; though the few species identified may be mentioned.

#### Lichenes\*.

Usnea barbata Fr.	Pertusaria velata Turn.
Ramalina calicularis Fr.	Calicium subtile Fr.
Evernia jubata Fr.	Cladonia pyxidata Fr.
Theloschistes parietina Norm.	Cladonia fimbriata Fr.
Parmelia perforata Ach.	Cladonia gracilis Fr.
Parmelia perlata Ach.	Cladonia mitrula Tuck.
Parmelia olivacea Ach.	Cladonia furcata Floerke.
Physcia pulverulenta Schreb.	Cladonia macilenta Hoffm.
Physcia speciosa Wulfen.	Cladonia rangiferina Hoffm.
Physcia stellaris L.	Biatora campestris Fr.
Physcia caesia Hoffm.	Biatora flexuosa Fr.
Physcia obscura Ehrh.	Biatora rubella Fr.
Peltigera canina Hoffm.	Biatora sanguineo-atra Fr.
Lecanora varia Fr.	Opegrapha varia Pers.
Lecanora subfusca Ach.	Graphis scripta Ach.
Placodium aurantiacum Lightf.	Collema nigrescens Huds.
Placodium ferrugineum Huds.	Leptogium pulchellum Ach.
Placodium cerinum Ach.	

#### Fungi.

Agaricus procerus Scop.	Polyporus igniarius L.
Agaricus decolorans Mich.	Polyporus arcularius Fr.
Agaricus radicatus Rehm.	Polyporus varius Fr.
Agaricus velutipes Curt.	Tranetes Peckii.
Agaricus pyxidatus Bull.	Merulius lacrimans Fr.
Agaricus domesticus Bolt.	Merulius spathularia Schw.
Agaricus cinereus Bull.	Clavaria aurea Schaeff.
Agaricus campestris L.	Clavaria botrytis Pers.
Agaricus rosaceus Nees.	Clavaria cristata Holmsk.
Agaricus lacceatus Scop.	Clavaria fastigiata D.C.
Agaricus ostreatus Jacq.	Tremella foliacea Pers.
Agaricus campanella Batsch.	Tremella lutescens Fr.
Agaricus flabelliformis Bolt.	Helvella esculenta Pers.
Lenzites tigrinus Fr.	Helvella crispa Fr.
Lenzites vialis Peck.	Morchella esculenta Pers.
Marasmius Rotula Scop.	Phallus Ravenelii B.&C.
Schizophyllum commune Fr.	Geaster mammosus Fr.
Favolus canadensis Klotsch.	Stemonitis fusca Roth.
Polyporus lucidus Fr.	Hemiarcyria rubiformis Pers.
Polyporus badius Schw.	Cyathus vernicosus D.C.
Polyporus versicolor L.	Crucibulum vulgare Tul.
Polyporus cinnabarinus Jacq.	Peziza badia Pers.
Polyporus picipes Fr.	Peziza aurantia Vahl.
Polyporus gilvus Schw.	Peziza coccinea Jacq.
Polyporus fomentarius L.	Peziza umbrina Pers.

\*The first part of Tuckerman's synopsis of N. Amer. Lichens containing Parmeliacei, Cladoniacei and Coenogoniacei enumerates 46 Genera 411 species and 58 subspecies, of which after Wolf and Hall 22 genera with 35 species are found in Illinois. Of the rest of the genera the first edition of Tuckerman's Lichenes (1848) contains only 16 genera and 109 species, and of those Wolf and Hall mention as occurring in Illinois 75 species, so that 468 species so far are known from Illinois.

*Peziza acetabulum* L.  
*Peziza luculenta* Cke.  
*Bovista nigrescens* Pers.  
*Lycoperdon pyxiforme* Schaeff.  
*Uromyces Lespedezae* Schw.  
*Uromyces Hedysari paniculati* Farl.  
*Uromyces Polygoni* Fekl.  
*Uromyces Howei* Peck.  
*Uromyces Caladii* Farl.  
*Uromyces Euphorbiae* C.&P.  
*Uromyces graminicola* Andr.  
*Ustilago Maydis* Cd.  
*Gymnosporangium macropus* L.N.  
*Phragmidium fragariae* Rostk.  
*Phragmidium mucronatum* Pers.  
*Chleosporium Sonchi-arvensis* Lev.  
*Melampsora salicina* Lev.  
*Caeoma agrimoniae* Schw.  
*Caeoma nitens* Schw.  
*Puccinia Podophylli* Schw.  
*Puccinia violae* D.C.  
*Puccinia Amorphae* Curt.  
*Puccinia Circaeae* Pers.  
*Puccinia galiorum* Lk.  
*Puccinia Kuhniae* Schw.  
*Puccinia Asteris* Duby.  
*Puccinia Silphii* Schw.  
*Puccinia Tanacetii* D.C.  
*Puccinia flosculorum* Roehl.  
*Puccinia Lobeliae* Gerard.

*Puccinia lateripes* B.&C.  
*Puccinia Menthae* Pers.  
*Puccinia aculeata* Schw.  
*Puccinia Polygoni amphibiae* Pers.  
*Puccinia Smilacis* Schw.  
*Puccinia caricis* Rehbent.  
*Puccinia graminis* Pers.  
*Puccinia Andropogi* Schw.  
*Puccinia Prunorum* Lk.  
*Puccinia phragmites* Kornike.  
*Roestelia pennicillata* Fr.  
*Roestelia lacerata* Fr.  
*Aecidium Ranunculi* Schw.  
*Aecidium Pteleae* B.&C.  
*Aecidium Psoraleae* Peck.  
*Aecidium grossulariae* D.C.  
*Aecidium oenotherae* Peck.  
*Aecidium compositarum* Burr.  
*Aecidium Euphorbiae* Gm.  
*Aecidium Erigeronatum* Schw.  
*Aecidium Podophylli* Schw.  
*Cystopus cubicus* Lev.  
*Cystopus candidus* Lev.  
*Cystopus Bliti* Lev.  
*Microsphaera Frisii* Lev.  
*Entyloma Menispermii* Farl.  
*Peronospora Arthuri* Farl.  
*Peronospora viticola* De.Bary.  
*Peronospora Halstedii* Farl.

#### Characeæ.

*Chara gymnopus* A.Br.  
*Chara contraria* A.Br.

*Nitella acuminata* var *subglomerata*  
 A.Br.

#### \*Algæ.

*Oscillaria nigra* Vauch.  
*Nostoc pruniforme* Agh.  
*Palmella hyalina* Lyngby?  
*Hydrodictyon utriculatum* Roth.  
*Spirogyra quinina* Kuetz.  
*Spirogyra setiformis* Kuetz.

*Hydrogastrium granulatum* Desv.  
*Vaucheria spec.*  
*Cladophora glomerata* Rabenh.  
*Draparnaldia plumosa* Agh.  
*Chaetophora elegans* Agh.  
*Batrachospermum moniliforme* Roth.

<sup>5</sup>Wood in "Fresh water Algae of North America" 1872 enumerates 46 genera, 411 species and 57 subspecies.

## COMPARATIVE STATISTICS.

The flora of Peoria contains 835 indigenous species of vascular plants, of which 139 are monocarpic, 583 rhizocarpic, and 113 woody. Possibly 30 or 40 species more may be found — most of them in water and swamps. This for so small an area, with a soil which is prevailingly arenaceous and humus, only partly argillaceous, with very little calcareous matter in it, is not a poor flora compared with those of larger areas. The flora of Illinois\*, when we exclude 29 species restricted to the shores of Lake Michigan, which form a part of the Canadian flora, and 56 species of the most southern part of the state along the Ohio and Wabash, belonging to the flora of the Ohio Valley, numbers 1,353 species of 525 genera in 122 orders; 504 species have not yet been found in the vicinity of Peoria, 220 of which are reported only from the southward, 131 from northward, 7 only from westward, and 158 as well north- as southward.

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\*The species excluded from the Illinois flora proper, so far only observed on the shore of Lake Michigan and along the Ohio and Wabash, are the following: On the shore of Lake Michigan — *Ranunculus cymbalaria* Ph., *Sarracenia purpurea* L., *Cakile americana* Nutt., *Hypericum kalmianum* L., *Drosera rotundifolia* L., *Drosera longifolia* L., *Lathyrus maritimus* Big., *Potentilla anserina* L., *Linnaea borealis* Gron., *Aster macrophyllus* L., *Solidago virga-aurea* L. var. *humilis*, *Solidago Muhlenbergii* T. Gr., *Silphium trifoliatum* L., *Cirsium Pitcheri* T. Gr., *Corispermum hyssopifolium* L., *Rumex maritimus* L., *Euphorbia polygonifolia* L., *Salix adenophylla* Hook., *Juniperus sabina* L. var. *procumbens*. Potamogeton *praelongus* Wulf., *Habenaria Hookeri* Torr., *Habenaria lacera* R. Br., *Medeola virginica* L., *Juncus balticus* Deth., *Juncus Gerardi* Lois., *Eriophorum virginicum* L., *Carex aurea* Nutt., *Carex Crawei* Dew., *Calamagrostis arenaria* Roth.; along the Ohio and Wabash — *Magnolia acuminata* L., *Cocculus carolinensis* D. C., *Calyco-carpum Lyoni* Nutt., *Naphar sagittifolia* Ph., *Cabomba caroliniana* Gr., *Corydalis flavula* Raf., *Draba brachycarpa* Nutt., *Elodes petiolata* Ph., *Cassia obtusifolia* L. *Myriophyllum ambiguum* Nutt., *Jussiaea repens* L., *Jussiaea decurrens* D. C., *Ludwigia cylindrica* Ell., *Galium lanceolatum* Torr., *Mikania scandens* L. *Solidago odorata* Ait., *Iva ciliata* Willd., *Verbesina occidentalis* Walt., *Anaphalis margaritacea* Benth. Hook., *Rhododendron nudiflorum* Torr., *Hottonia inflata* Ell., *Catalpa speciosa* Ward., *Epiphegus virginiana* Bart., *Verbena Aubletia* L., *Scutellaria serrata* Andr., *Pycnanthemum muticum* Pers. (forma typica), *Hydrophyllum macrophyllum* Nutt., *Phacelia Purshii* Buckl., *Hydrolea affinis* Gr., *Obolaria virginica* L., *Trachelospermum difforme* Gr., *Gonolobus laevis* Michx., *Iresine celosioides* L., *Brunnichia cirrhosa* Banks, *Acalypha caroliniana* Walt., *Tragia macrocarpa* Willd., *Quercus lyrata* Walt., *Quercus Phellos* L., *Fagus ferruginea* Ait., *Taxodium distichum* Rich., *Cupressus thyoides* L., *Najas indica* var. *gracilima* A. Br., *Goodyera repens* R. Br., *Iris cuprea* Ph., *Commelina erecta* L., *Heteranthera reniformis* R. P., *Heteranthera limosa* Vahl., *Cyperus flavescens* L., *Fuirena squarrosa* Michx., *Rhynchospora corniculata* Gr., *Carex gigantea* Rudge, *Arundinaria tecta* Muhl., *Leptochloa mucronata* Kth., *Dicksonia punctilobula* Kunze, *Botrychium lunarioides* Sw. var. *obliquum*, *Orhiglossum vulgatum* L.



A number of local floras and such of larger districts of the same geographical latitude or longitude are given in the following table, but it must be remarked that all mere varieties and all introduced species are excluded, and that the figures mean the number of the entire states, even if they, like New York state, Ohio, Illinois, and Wisconsin, belong to different natural floral districts:

	Massachusetts	New York.	Ohio.	Chester Co. Pa. Newcastle Co., Del.	Washington, D.C.
Area in Sq. Miles.	7,800	47,000	40,000	128	108
<i>Vascular Plants:</i>					
Genera.....	443	533	453	436	426
Species.....	1162	1330	1232	981	922

	Illinois.	Colorado.	Michigan. Lower Peninsula.	Wisconsin	Arkansas.	Louisiana.
Area in Square Miles...	55,400	104,500	33,400	53,900	52,200	41,300
<i>Vascular Plants:</i>						
Genera.....	551	430	446	450	562	588
Species .....	1431	1145	1094	1104	1233	1555

The comparatively large number of species in Illinois is readily explained by the wide extension of this state in a south-north direction over 5° of latitude. The number of species in \*Michigan, Wisconsin, Arkansas, and particularly in Colorado may really show greater figures, as those states are apparently not so thoroughly explored in all parts.

Generally the eight or ten largest orders make up half of the whole number of vascular species of a floral district. The following tables will show the per mille of species for each of the largest orders:

<i>Massachusetts.</i>	<i>New York.</i>	<i>Ohio.</i>
Cyperaceæ..... 116	Cyperaceæ..... 113	Compositæ..... 122
Compositæ..... 108	Compositæ..... 104	Cyperaceæ..... 95
Gramineæ..... 73	Gramineæ..... 79	Gramineæ..... 65
Rosaceæ..... 38	Rosaceæ..... 36	Leguminosæ..... 40
Ericaceæ..... 33	Leguminosæ..... 34	Rosaceæ..... 36
Filices..... 32	Ericaceæ..... 30	Orchidaceæ..... 32
Leguminosæ..... 26	Filices..... 30	Filices..... 30
Orchidaceæ..... 26	Orchidaceæ..... 29	Ranunculaceæ..... 29
Scrophulariaceæ..... 24	Scrophulariaceæ..... 25	Labiatae..... 28
Labiatae..... 22	Labiatae..... 25	Liliaceæ..... 28
498	505	505

\*\* Michigan means here the lower peninsula, and the flora is taken from the first Report of Geological Survey of Michigan, 1861. The flora of Wisconsin after Lapham's Catalogue in Transactions of the Wisconsin State Agricultural Society, 1853, with two additions by Hale. The flora of Arkansas is after Lesquereux' Catalogue in Arkansas Geological Survey (1860). The flora of Colorado is after Porter and Coulter (1874).

<i>Chester, Pa.; New-castle, Del.</i>		<i>Michigan.</i>		<i>Wisconsin.</i>	
Compositæ.....	130	Compositæ.....	116	Compositæ.....	123
Cyperaceæ.....	83	Cyperaceæ.....	100	Cyperaceæ.....	90
Gramineæ.....	78	Gramineæ.....	73	Gramineæ.....	72
Leguminosæ.....	40	Rosaceæ.....	46	Rosaceæ.....	40
Rosaceæ.....	33	Leguminosæ.....	38	Leguminosæ.....	38
Filices.....	32	Orchidaceæ.....	35	Filices.....	30
Orchidaceæ.....	29	Scrophulariaceæ...	28	Orchidaceæ.....	26
Labiata.....	28	Ranunculaceæ.....	26	Scrophulariaceæ...	26
Ericaceæ.....	26	Filices.....	25	Ranunculaceæ.....	26
Scrophulariaceæ....	23	Labiata.....	25	Liliaceæ.....	24
	<hr/>		<hr/>		<hr/>
	502		512		495
<i>Arkansas.</i>		<i>Louisiana.</i>		<i>Colorado.</i>	
Compositæ.....	164	Compositæ.....	172	Compositæ.....	161
Gramineæ.....	78	Leguminosæ.....	70	Leguminosæ.....	82
Leguminosæ.....	77	Gramineæ.....	66	Gramineæ.....	78
Cyperaceæ.....	46	Cyperaceæ.....	58	Cyperaceæ.....	53
Labiata.....	35	Scrophulariaceæ...	29	Scrophulariaceæ...	42
Scrophulariaceæ....	28	Rosaceæ.....	23	Rosaceæ.....	38
Rosaceæ.....	27	Umbelliferae.....	20	Ranunculaceæ.....	37
Filices.....	25	Labiata.....	19	Cruciferae.....	30
Umbelliferae.....	24	Onagraceæ.....	19	Saxifragaceæ.....	28
Cruciferae.....	21	Orchidaceæ.....	18	Polygonaceæ.....	28
	<hr/>		<hr/>		<hr/>
	525		494		577
<i>Illinois.</i>		<i>Peoria.</i>		<i>Washington, D. C.</i>	
Compositæ.....	132	Compositæ.....	158	Compositæ.....	130
Cyperaceæ.....	92	Cyperaceæ.....	90	Cyperaceæ.....	89
Gramineæ.....	75	Gramineæ.....	84	Gramineæ.....	85
Leguminosæ.....	49	Leguminosæ.....	45	Leguminosæ.....	45
Rosaceæ.....	36	Rosaceæ.....	30	Rosaceæ.....	34
Scrophulariaceæ...	28	Labiata.....	27	Labiata.....	31
Labiata.....	27	Ranunculaceæ.....	26	Filices.....	28
Ranunculaceæ.....	26	Scrophulariaceæ...	26	Scrophulariaceæ...	27
Filices.....	25	Umbelliferae.....	20	Ericaceæ.....	25
Liliaceæ.....	23	Filices.....	20	Ranunculaceæ.....	24
	<hr/>		<hr/>		<hr/>
	513		526		518

The relative number of Compositæ increases toward the south and west, and only in Massachusetts and New York they do not take the first place; the Gramineæ take nearly throughout the third place. The number of Leguminosæ increases southward in a great proportion; while the Rosaceæ prevail in the north and decrease southward. The Ericaceæ, so numerous in the east, are little represented in the west; the Labiata increase southward, the Scrophulariaceæ westward; the Orchidaceæ and Filices take a higher position in rank in the north than in the south; the Ranunculaceæ are most represented in Colorado, and only little in the south. The Liliaceæ have only in Ohio, Illinois and Wisconsin a place amongst the ten prevalent orders. Umbelliferae and Cruciferae increase

in number southwestward, and so do the Onagraceæ. In Colorado we find the Saxifragaceæ and Polygonaceæ amongst the prominent, the latter chiefly by the numerous species of Eriogonum, of which sixteen are reported from that state, and the like number inhabit the Rocky Mountains.

The floras of the Northern States (Gray) and Southern States (Chapman) west of the Mississippi compared in the same way show the following figures:

N. Sts.....	Compositæ.....	122	Cyperaceæ.....	104	Gramineæ.....	75	Leguminosæ.....	41
S. Sts.....	Compositæ.....	145	Cyperaceæ.....	92	Gramineæ.....	71	Leguminosæ.....	54
N. Sts.....	Rosaceæ.....	31	Ericaceæ.....	28	Liliacæ.....	24	Filices.....	24
S. Sts.....	Labiata.....	27	Scrophulariaceæ.....	25	Ericaceæ.....	24	Liliacæ.....	24
N. Sts.....	Orchidaceæ.....	23	Scrophulariaceæ.....	22	Ranunculaceæ.....	21	Labiata.....	21
S. Sts.....	Rosaceæ.....	22	Orchidaceæ.....	21	Filices.....	20	Ranunculaceæ.....	19
N. Sts.....	Cruciferae.....	19	Umbelliferae.....	16	Caryophyllaceæ.....	16	Saxifragaceæ.....	15
S. Sts.....	Umbelliferae.....	17	Euphorbiaceæ.....	15	Onagraceæ.....	15	Caryophyllaceæ.....	14
N. Sts.....	Juncaceæ.....	13	Onagraceæ.....	12	Euphorbiaceæ.....	12	Caprifoliaceæ.....	12
S. Sts.....	Cruciferae.....	14	Saxifragaceæ.....	13	Polygonaceæ.....	12	Asclepiadaceæ.....	12
N. Sts.....	Najadaceæ.....	12	Polygonaceæ.....	11	Gentianaceæ.....	10	Cupuliferae.....	10
S. Sts.....	Convolvulaceæ.....	11	Gentianaceæ.....	10	Cupuliferae.....	10	Hypericaceæ.....	10

Comparing both rows, we find that the four first orders keep the same rank; that the Labiata, Scrophulariaceæ, Euphorbiaceæ, and Onagraceæ take a higher position in the south than in the north; and vice versa the Rosaceæ, Filices, Cruciferae, and Saxifragaceæ. In the second row we miss the Juncaceæ, Caprifoliaceæ, and Najadaceæ; they are replaced by the Asclepiadaceæ, Convolvulaceæ, and Hypericaceæ, that are not represented in the first row; the rest take nearly the same position in both rows.

## GEOGRAPHICAL DISTRIBUTION OF OUR GENERA AND SPECIES.

Those fanciful believers in centres of creation (not centres of preservation as proposed by Bentham), rejecting any theory of descent, set a great value upon the so called endemism and monotypes. As they admit only of recent means of distribution, excluding all geological agencies, endemism is to them the principal proof of an originality of certain floral areas. Monotypes are mostly the arbitrary make of systematists prone to narrow limitations of genera or to wide limitations of species, or the result of an incomplete knowledge of species. *Hepatica* is a monotype as soon as separated from *Anemone* and when at the same time we join as varieties with the species *H. triloba* the little defined species, that have been proposed; but as soon as the latter be acknowledged as species, the genus would cease to be a monotype. *Pentachæta* was a monotype when Nuttall proposed it, but Gray decribed a second species and joined another monotype *Aphantochæta*; so both of them ceased to be monotypes. Such examples are many; only from the order compositæ may be mentioned: Cor-

ethrogyne D. C. now with 3 species, Hulsea T. & G. with 6, Actinolepis D. C. after Bentham with 8 species; Oxyura D. C. recently united with Layia, Tuckermania Nutt with Leptosyne, Coinogyne Less. with Jaumea Pers.

Of what value endemism is to the believed originality of floral areas and how little contented we ought to be with exclusively recent agencies of distribution shows *Phryma leptostachya* a monotype genus and after Schauer even a monotype order. It is unimaginable that this plant now found only in North America and in the Himalayas, by means of recent agencies could have migrated from one to the other of its actual habitats. Its disjoint existence is explicable only from geological and climatical changes and progressive extinction of the plant in the intermediate countries; for a double origin cannot be imagined. It is true paleontologists made not known this or another related species from former geological periods, but it is a fact, that other monotypes f. i. *Liriodendron* now only found in North America existed in the tertiary period in very distant countries, in Greenland as well as in Germany and Italy. Should that not lead to the conclusion that, what are now monotypes, be the last members of once widely distributed genera now in process of extinction? Analogous examples are offered in zoology; only compare the small number of recent Ganoids with the richness of former geological periods.

Lately not less than 10 California monotypes were proposed, the greater part probably waiting for the company of new foundlings.

Systematization so much subject to change united recently *Solea* to *Ionidium*, *Zizia* to *Pimpinella* and *Gymnostichum* with *Asprella*, so that our flora would now contain only 21 monotypes, viz: *Hydrastes*, *Sanguinaria*, *Anychia*, *Napaea*, *Floerkea*, *Apios*, *Gymnocladus*, *Echinocystis*, *Dodecatheon*, *Phryma*, *Jsanthus*, *Menyanthes*, *Montelia*, *Sassafras*, *Dirca*, *Peltandra*, *Aplectrum*, *Schollera*, *Dulichium*, *Brachyelytrum* and *Diarrhena*. *Caulophyllum* and *Ieffersonia* are excluded; since in addition to each a second species is known from Eastern Asia (Amur). Besides *Phryma* only *Menyanthes* occurs outside of the American continent: it is widely distributed over Europe and Asia. That was no monotype to Linnæus, when he proposed the genus, but afterwards there were three genera formed of it, *Limnanthemum* and *Villarsia*; so *Menyanthes trifoliata* became a monotype. A small area cover *Hydrastes*, *Napaea* and *Diarrhena*; westward reach the Pacific coast only *Floerkea*, *Dodecatheon* and *Dirca*, the Gulf coast *Sanguinaria*, *Anychium*, *Apios*, *Phryma*, *Sassafras*, *Dirca*, *Peltandra*, *Dulichium* and *Brachyelytrum*. Over the Alleghanies do not pass *Napaea* and *Diarrhena*. Westward occur *Schollera* in Nevada, *Montelia* in Texas, and in the western plains *Apios*, *Gymnocladus*, *Echinocystis*, *Peltandra* (?) *Aplectrum* and *Dulichium*.

Of the 384 genera of our local flora 22 are restricted to the east of North America. These are, besides the above mentioned monotypes: *Elodes*, *Boltonia*, *Blephilia*, *Onosmodium*, *Carya*, *Oryzopsis*, *Eatonia* and

Tricuspis, of the exclusively North American genera reach the Rocky Mountains or the Pacific coast 35: *Lechea*, *Callirhoe*, *Ptelea*, *Floerkea*, *Amorpha*, *Petalostemon*, *Apios*, *Baptisia*, *Proserpinaca*, *Heuchera*, *Gaura*, *Thaspium*, *Liatris*, *Chrysopsis*, *Polymnia*, *Silphium*, *Echinacea*, *Rudbeckia*, *Lepachys*, *Krigia*, *Troximon*, *Dodecatheon*, *Aphyllon*, *Chelone*, *Pentstemon*, *Monarda*, *Physostegia*, *Pycnanthemum*, *Hydrophyllum*, *Ellisia*, *Amsonia*, *Dirca*, and *Bouteloua*.

Of our genera restricted to the Western Hemisphere occur with single species in Mexico or South America 12: *Ceanothus*, *Oenothera*, *Parthenium*, *Heliopsis*, *Helenium*, *Seymeria*, *Gerardia*, *Castilleja*, *Asclepias*, *Oxybaphus* and *Echinodorus*, 8 are chiefly South American and partly North American: *Asimina*, *Cuphea*, *Kuhnia*, *Actinomeris*, *Helianthus*, *Dysodia*, *Conobea* and *Tradescantia*.

A number of genera are common to North America and Eastern Asia or the Himalayas, of which 26 are represented in our flora amongst which is *Phryma*. Genera with one species in each continent are: *Menispermum*, *Jeffersonia*, *Caulophyllum*, *Podophyllum*, *Nelumbium*, *Negundo*, *Cryptotania*, *Penthorum*, *Hamamelis*, *Saururus*, *Symplocarpus*, and of our two species of *Osmorrhiza* one is found in Eastern Asia; the 12 species of *Dicentra* are equally divided, 6 for each continent. Chiefly Asiatic are: *Ampelopsis*, *Amphicarpæa*, *Hydrangea*, *Arisæma*. Chiefly American: *Claytonia*, *Mitella*, *Archemora*, *Triosteum*, *Nabalus* (now united with *Prenanthes*), *Lophanthus*, *Phlox*, *Uvularia* and *Trillium*.

Many tropic genera are represented by one or a few species in North America, of which we find in our flora the following:

N.B. \* Means that the genus is a large one with 50 and more species, † means that the genus is chiefly South American.

<i>Polanisia</i> .	<i>Gaylussacia</i> .	<i>Hypoxis</i> .
<i>Mollugo</i> .	* <i>Tecoma</i> .	* <i>Habenaria</i> .
* <i>Zanthoxylum</i> .	* <i>Diospyros</i> .	<i>Spiranthes</i> .
* <i>Crotalaria</i> .	* <i>Plantago</i> .	<i>Liparis</i> .
* <i>Psoralea</i> .	<i>Ilysanthes</i> .	* <i>Dioscorea</i> .
* <i>Tephrosia</i> .	* <i>Ruellia</i> .	<i>Pontederia</i> .
* <i>Desmodium</i> .	* <i>Verbena</i> .	* <i>Cyperus</i> .
* <i>Cassia</i> .	* <i>Lippia</i> .	<i>Fimbristylis</i> .
<i>Desmanthus</i> .	† <i>Ipomoea</i> .	* <i>Scleria</i> .
* <i>Phaseolus</i> .	†* <i>Solanum</i> .	<i>Leersia</i> .
* <i>Impatiens</i> .	* <i>Physalis</i> .	* <i>Vilfa</i> .
<i>Ammannia</i> .	<i>Datura</i> .	* <i>Sporobolus</i> .
<i>Sicyos</i> .	* <i>Aristolochia</i> .	* <i>Muhlenbergia</i> .
* <i>Spermacoe</i> .	<i>Phytolacca</i> .	* <i>Panicum</i> .
<i>Cephalanthus</i> .	* <i>Euphorbia</i> .	<i>Cenchrus</i> .
* <i>Vernonia</i> .	* <i>Acalypha</i> .	* <i>Andropogon</i> .
†* <i>Eupatorium</i> .	* <i>Laportea</i> .	<i>Chrysopogon</i> .
<i>Eclipta</i> .	* <i>Pilea</i> .	† <i>Adiantum</i> .
† <i>Ambrosia</i> .	<i>Boehmeria</i> .	<i>Pteris</i> .
<i>Erechtites</i> .	* <i>Celtis</i> .	<i>Azolla</i> .
†* <i>Lobelia</i> .		

All the other genera are either cosmopolitan or predominate in the northern temperate zone of both hemispheres, though some are chiefly North American as: Aster, Erigeron, Solidago, Polemonium, Fraxinus and Comandra.

When the entire upper Mississippi valley to the 38° N. L. emerged the last time, after the drift period, then it is obvious that the whole concern of our flora must have immigrated. The relationship and the present center of preservation of each species will point to the direction of the probable immigration.

There are only a few species, that so far are observed only in the upper Mississippi district: *Desmodium Illinoense* A.Gr. *Aster anomalus* Engelm., *Phlox bifida* Beck., *Aselepias Meadii* Torr., *Trillium recurvatum* Beck., *Eleocharis Wolfii* Gr. These may elsewhere been overlooked or taken for other species; they may have been formed by variation or hybridation in the present period, but not spread over a wider territory or they may have covered a wider area and be restricted now to their present habitat; all that is possible but not proved.

The majority of the species no doubt came from the Alleghannies; for not less than 715 extend to that mountain range and 642 of them surpass the same. A good many of such species, that America has in common with the eastern continent, (114 of our flora) may have immigrated from the north.

All the species that in the same latitude do not reach the Alleghannies but have their eastern limits in Ohio, Indiana, or Illinois may be either western or southern. The southern species (excepted those that keep along the coast) go generally farther northward in the west than in the east of the Alleghannies.

Besides the above mentioned 6 species 48 others do not extend to Ohio, and of those came probably from the south 13:

<i>Nasturtium sessilifolium.</i>	<i>Coreopsis lanceolata.</i>
<i>Callirhoe triangulare.</i>	<i>Lobelia leptostachys.</i>
<i>Cornus asperifolia.</i>	<i>Amsonia tabernaemontana.</i>
<i>Eupatorium serotinum.</i>	<i>Carya olivæformis.</i>
<i>Liatris cylindracea.</i>	<i>Leersia lenticularis.</i>
<i>Rudbeckia subtomentosa.</i>	<i>Panicum autumnale.</i>
<i>Coreopsis palmata.</i>	

From southwest 10:

<i>Desmantus brachylobus.</i>	<i>Dysodia chrysanthemoides.</i>
<i>Liatris pycnostachya.</i>	<i>Hieracium longipilum.</i>
<i>Erigeron divaricatum.</i>	<i>Euphorbia heterophylla.</i>
<i>Ambrosia bidentata.</i>	<i>Echinodorus rostratus.</i>
<i>Ambrosia psilostachya.</i>	<i>Cyperus acumiatus.</i>

From west 20:

<i>Clematis Pitcheri.</i>	<i>Echinacea angustifolia.</i>
<i>Anemone decapetala.</i>	<i>Helianthus rigidus.</i>
<i>Nasturtium sinuatum.</i>	<i>Androsace occidentalis.</i>
<i>Psoralea florbunda.</i>	<i>Mimulus Jamesii.</i>
<i>Petalostemon violaceum.</i>	<i>Gerardia grandiflora.</i>
<i>Petalostemon candidum.</i>	<i>Verbena bracteosa.</i>
<i>Amorpha canescens.</i>	<i>Lithospermum angustifolium.</i>
<i>Lythrum alatum.</i>	<i>Oxybaphus nyctagineus.</i>
<i>Solidago missouriensis.</i>	<i>Amarantus blitoides.</i>
<i>Chrysopsis villosa.</i>	<i>Equisetum lævigatum.</i>

From northwest 4:

<i>Viola delphinifolia.</i>	<i>Troximon cuspidatum.</i>
<i>Artemisia ludoviciana.</i>	<i>Stipa spartea.</i>

From north 1:

*Equisetum palustre.*

There are 49 species that extend eastward only to Ohio. Those marked \* occur in the southern Alleghannies, but do not reach those mountains in the latitude of Illinois.

From southeast may come 5:

* <i>Aster Shortii.</i>	* <i>Prenanthes crepidinea.</i>
<i>Solidago Riddellii.</i>	* <i>Fraxinus quadrangulata.</i>
* <i>Silphium perfoliatum.</i>	

From south 20:

<i>Isopyrum biternatum.</i>	<i>Coreopsis aristosa.</i>
<i>Thelypodium pinnatifidum.</i>	<i>Cacalia tuberosa.</i>
<i>Hypericum sphaerocarpum.</i>	* <i>Ruellia ciliosa.</i>
* <i>Ptelea trifoliata.</i>	<i>Verbena stricta.</i>
* <i>Baptisia leucantha.</i>	<i>Onosmodium molle.</i>
* <i>Baptisia leucophæa.</i>	<i>Lithospermum latifolium.</i>
<i>Spermacoce glabra.</i>	* <i>Gentiana pubera.</i>
* <i>Vernonia fasciculata.</i>	<i>Acerates longifolia.</i>
<i>Silphium laciniatum.</i>	<i>Carex crus corvi.</i>
* <i>Silphium terebinthaceum.</i>	<i>Eragrostis pectinacea.</i>

From southwest 10:

<i>Ammannia coccinea.</i>	<i>Conobea multifida.</i>
<i>Silphium integrifolium.</i>	<i>Seymeria macrophylla.</i>
<i>Helianthus grosseserratus.</i>	<i>Asclepias Sullivantii.</i>
<i>Verbesina helianthoides.</i>	<i>Diarhena americana.</i>
<i>Prenanthes aspera.</i>	<i>Montelia tamariscina.</i>

From west 4:

<i>Prenanthes racemosa.</i>	<i>Scilla Fraseri.</i>
<i>Cuscuta glomerata.</i>	<i>Equisetum robustum.</i>

From northwest 8:

Ludwigia polycarpa.  
Aster junceus.  
Artemisia biennis.  
Habenaria leucophaea.

Trillium nivale.  
Eragrostis Frankii.  
Hordeum pratense.  
Hordum jubatum.

From north 2:

Carex arida.

Poa sylvestris.

Of 50 species, that reach the Alleghannies in the latitude of Illinois, but do not pass over, are probably southern 11:

Asimina triloba.  
Gleditschia triacanthos.  
Amorpha fruticosa.  
Boltonia asteroides.  
Eclipta alba.  
Rudbeckia triloba.

Lepachys pinnata.  
Coreopsis tripteris.  
Ruellia strepens.  
Ipomoea lacunosa.  
Euphorbia commutata.

From southwest 4:

Aster sericeus.  
Parthenium integrifolium.

Lippia lanceolata.  
Euphorbia dentata.

From west 2:

Helianthus laetiflorus.

Melica mutica.

From northwest 1:

Spiraea Aruncus.

The rest (32 species) extend from the Alleghannies westward, but not eastward.

Delphinium tricornis.  
Jeffersonia diphylla.  
Napaea dioica.  
Hibiscus militaris.  
Rhamnus lanceolatus.  
Aesculus glabra.  
Trifolium reflexum.  
Psoralea onobrychis.  
Desmodium sessilifolium.  
Gymnocladus canadensis.  
Spiraea lobata.  
Agrimonia parviflora.  
Rosa Setigera.  
Heuchera hispida.  
Galium concinnum.  
Eupatorium altissimum.

Aster azureus.  
Solidago Ohioensis.  
Polymnia canadensis.  
Echinacea purpurea.  
Helianthus doronicoides.  
Helianthus occidentalis.  
Cacalia reniformis.  
Cacalia atriplicifolia.  
Steironema longifolia.  
Pycnanthemum pilosum.  
Scutellaria versicolor.  
Phlox maculata.  
Phlox glaberrima.  
Ellisia nyctelaea.  
Cuscuta inflexa.  
Cypripedium candidum.



All the other species we have in common with the Eastern States; but judging from the centres of preservation, it seems that we have from the South 20.

*Polygala incarnata.*  
*Crotalaria sagittalis.*  
*Desmodium pauciflorum.*  
*Cercis canadensis.*  
*Cassia marilandica.*  
*Cassia chamaecrista.*  
*Mollugo verticillata.*  
*Erynechium yuccaefolium.*  
*Rudbeckia hirta.*  
*Diospyros virginiana.*

*Tecoma radicans.*  
*Verbena hastata.*  
*Verbena urticifolia.*  
*Lithospermum hirtum.*  
*Ipomoea pandurata.*  
*Solanum carolinense.*  
*Euphorbia corollata.*  
*Croton glandulosus.*  
*Cyperus erythrorhizus.*  
*Azolla caroliniana.*

From Southwest 9.

*Linum sulcatum.*  
*Kuhnia eupatorioides.*  
*Monarda fistulosa.*  
*Physostegia virginiana.*  
*Cuscuta tenuiflora.*

*Polygonum tenue.*  
*Euphorbia dentata.*  
*Cyperus phymatodes.*  
*Hemicarpha subsquarrosa.*

From West 8.

*Ranunculus fascicularis.*  
*Sisymbrium canescens.*  
*Ceanothus americanus.*  
*Negundo aceroides.*

*Salix longifolia.*  
*Eatonia obtusata.*  
*Festuca tenella.*  
*Carex umbellata.*

From Northwest 44.

*Actaea alba.*  
*Claytonia Virginica.*  
*Ranunculus abortivus.*  
*Astragalus canadensis.*  
*Potentilla norvegica.*  
*Potentilla arguta.*  
*Rubus occidentalis.*  
*Rosa blanda.*  
*Epilobium palustre.*  
*Epilobium coloratum.*  
*Heracleum lanatum.*  
*Osmorhiza longistylis.*  
*Osmorhiza brevistylis.*  
*Aralia racemosa.*  
*Aralia nudicaulis.*  
*Cornus stolonifera.*  
*Galium aparine.*  
*Dodecatheon Meadia.*  
*Utricularia vulgaris.*  
*Veronica Anagallis.*  
*Veronica Americana.*  
*Veronica peregrina.*

*Mentha canadensis.*  
*Scutellaria galericulata.*  
*Lithospermum canescens.*  
*Polemonium reptans.*  
*Menyanthes trifoliata.*  
*Ceratophyllum demersum.*  
*Populus tremuloides.*  
*Typha latifolia.*  
*Alisma Plantago.*  
*Smilacina stellata.*  
*Carex lanuginosa.*  
*Carex Richardsonii.*  
*Carex Buxbaumii.*  
*Carex stricta.*  
*Carex disticha.*  
*Carex teretiuscula.*  
*Carex stellulata.*  
*Calamagrotis canadensis.*  
*Köleria cristata.*  
*Poa pratensis.*  
*Poa serotina.*  
*Elymus striatus.*

From North 23.

Viburnum Opulus.	Salix cordata.
Achillea millefolium.	Salix myrtilloides.
Senecio aurea.	Sparganium eurycarpum.
Taraxacum dens leonis.	Triglochin palustre.
Arctostaphylos uva ursi.	Triglochin maritimum.
Lysimachia thyrsoiflora.	Habenaria hyperborea.
Utricularia intermedia.	Eleocharis palustris.
Veronica scutellata.	Eriophorum gracile.
Lycopus sinuatus.	Rynchospora alba.
Stachys palustris.	Carex limosa.
Polygonum aviculare.	Poa compressa.
Salix candida.	

In common with the Eastern Continent, our flora contains 114 species; of these six (*Ranunculus multifidus*, *Claytonia virginica*, *Mitella diphylla*, *Artemisia biennis*, *Bromus ciliatus* and *Adiantum pedatum*) extend only to East Siberia and not farther westward.

Of the 116 species, which, after A. de Candolle (*Géographie Botanique*, p. 564), are widely distributed, our flora contains thirty-two, all European, except *Eclipta alba*, a tropical plant, and *Erigeron canadense*, an immigrant in Europe.

Species that are found in Australia (Hooker's *Introduction to the Flora of Australia*) we have twenty-five, in Guyana (Schomburgk) are twenty-three, and Grisebach's West Indian plants contain fifty of our flora.

Only three species extend to the polar region of Northern Greenland: *Habenaria hyperborea*, *Calamagrostis canadensis* and *Bromus Kalmii*. Besides those three forty-six more extend to the arctic circle.

The distribution of our species over the natural floral districts of N. America will show in the following tables:

DISTRIBUTION OF THE SPECIES OF THE FLORA  
OF PEORIA OVER NORTH AMERICA.

This table shows how many species of each order the different floral provinces have in common with Peoria:

	Peoria	Can.....	N. Atl.	All.....	Ohio.....	S. Atl.	Ind.....	Up Mo.	R. Mts.	N. Mex.	Ne.....	Cal.....	Ore.....	Huds...	Alaska	Arct....
Ranunculaceae	22	18	18	19	20	14	17	18	13	10	5	1	1	10	4	2
Anonaceae	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Menispermaceae	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Berberidaceae	3	2	2	3	3	1	1	1	1	1	1	1	1	1	1	1
Nymphaeaceae	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1
Papaveraceae	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fumariaceae	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1
Cruciferae	14	11	11	11	12	7	12	6	5	4	5	4	4	3	2	3
Capparidaceae	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Violaceae	6	4	5	5	5	3	3	3	2	1	1	1	1	2	1	1
Cistaceae	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1
Hypericaceae	5	4	4	4	5	2	3	1	1	1	1	1	1	1	1	1
Caryophyllaceae	7	6	6	7	7	3	5	5	5	3	3	2	3	2	3	2
Paronychiaceae	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Portulacaceae	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Malvaceae	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2
Tiliaceae	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Linaceae	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Geraniaceae	6	6	6	6	6	5	5	6	5	2	1	1	3	1	1	1
Rutaceae	2	2	1	1	2	2	2	2	1	1	1	1	1	1	1	1
Anacardiaceae	3	3	3	3	3	3	3	3	2	2	3	1	2	1	1	1
Vitaceae	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3
Rhamnaceae	3	2	2	3	3	1	2	1	1	1	1	1	1	1	1	1
Celastraceae	2	2	2	2	2	1	2	2	1	1	1	1	1	1	1	1
Sapindaceae	5	4	4	5	5	3	4	2	1	1	1	1	1	1	1	1
Polygalaceae	4	4	4	4	4	3	4	2	1	1	1	1	1	1	1	1
Leguminosae	38	29	24	30	32	28	33	30	7	13	2	2	3	5	1	2
Rosaceae	25	23	21	24	24	13	18	15	10	8	5	3	3	7	2	3
Saxifragaceae	7	6	6	7	7	2	3	2	1	1	1	1	1	1	1	1
Crassulaceae	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hamameliaceae	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Haloragaeae	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Onagraceae	10	8	8	8	9	4	7	10	6	3	1	3	5	3	1	1
Lythraceae	4	2	2	2	3	2	4	2	2	2	1	2	2	2	2	2
Cucurbitaceae	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1
Ficoideae	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Umbelliferae	17	17	17	17	17	8	11	8	7	4	5	4	2	3	1	1
Araliaceae	3	3	3	3	3	1	1	2	2	2	2	2	2	2	2	2
Cornaceae	6	5	5	6	5	4	4	1	1	1	1	1	1	1	1	1
Caprifoliaceae	8	8	8	8	8	2	3	2	3	2	2	2	2	2	2	2
Rubiaceae	7	5	5	6	7	5	5	4	4	4	3	4	3	3	2	1
Compositae	131	97	79	101	112	68	97	81	41	42	18	15	12	32	4	6
Lobeliaceae	6	5	5	5	5	3	6	4	1	1	1	1	1	1	1	1
Campanulaceae	3	3	3	3	3	2	3	1	1	1	1	1	1	1	1	1
Ericaceae	4	3	4	4	4	2	1	2	2	1	2	2	2	1	1	1
Ebenaceae	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Primulaceae	7	5	4	6	6	2	4	4	3	1	4	2	2	1	1	1
Oleaceae	5	5	4	4	5	3	3	2	1	1	1	1	1	1	1	1
Apocynaceae	3	2	2	2	2	3	3	2	2	2	2	2	2	1	1	1
Asclepiadaceae	12	9	9	9	11	6	8	6	3	5	2	2	2	1	1	1
Gentianaceae	5	4	4	4	5	1	1	1	1	1	1	1	1	1	1	1
Polemoniaceae	6	3	3	5	5	3	4	1	1	1	1	1	1	1	1	1
Hydrophyllaceae	3	2	2	3	3	1	2	3	2	1	1	1	1	1	1	1
Borraginaceae	8	6	5	5	7	3	5	1	3	2	1	1	1	2	1	1

	Peoria..	Can.....	N. Atl..	All.....	Ohio....	S. Atl..	La.....	Up Mo.	R. Mss.	N. Mex	Nev.....	Cal.....	Ore.....	Huds....	Alaska	Arct....
Convolvulaceae.....	10	5	7	9	10	6	7	3	3	5	2	1	1	1	...	...
Solanaceae.....	5	5	5	5	5	5	5	5	4	2	2	2	2	1	...	...
Scrophulariaceae.....	22	17	17	17	19	11	16	10	7	6	5	5	7	3	2	...
Orobanchaceae.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	...	...
Lentibulariaceae.....	2	2	2	2	2	...	1	1	1	...	1	1	1	2	...	...
Bignoniaceae.....	1	...	...	1	1	1	1	...	...	...	...	...	...	...	...	...
Acanthaceae.....	2	2	...	2	2	2	2	1	...	1	...	...	...	...	...	...
Verbenaceae.....	6	3	3	4	5	4	6	5	4	5	2	2	2	...	...	...
Labiatae.....	23	19	21	23	23	11	19	10	9	7	8	5	5	6	1	...
Plantaginaceae.....	3	2	3	3	3	2	3	1	...	1	...	1	...	...	...	...
Aristolochiaceae.....	2	2	2	2	2	1	2	1	...	...	...	...	...	...	...	...
Nyctaginaceae.....	1	...	...	...	...	1	1	1	1	1	...	...	...	...	...	...
Phytolaccaceae.....	1	1	1	1	1	1	1	1	...	1	...	...	...	...	...	...
Chenopodiaceae.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	...	...
Amarantaceae.....	4	3	2	2	3	2	3	4	3	4	2	2	2	...	...	...
Polygonaceae.....	16	16	16	16	16	11	13	10	5	8	4	4	4	4	1	1
Lauraceae.....	1	1	1	1	1	1	1	1	...	...	...	...	...	...	...	...
Thymelaeae.....	1	1	1	1	1	1	1	1	1	...	...	1	...	...	...	...
Santalaceae.....	1	1	1	1	1	...	1	1	1	1	...	1	1	...	...	...
Saururaceae.....	1	1	1	1	1	1	1	...	...	...	...	...	...	...	...	...
Ceratophyllaceae.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	...	...
Callitrichaceae.....	1	1	1	1	1	1	1	1	1	1	...	1	1	1	1	1
Euphorbiaceae.....	9	5	4	8	8	7	7	6	1	6	1	1	1	...	...	...
Urticaceae.....	10	10	10	10	10	7	10	10	3	7	4	1	1	...	...	...
Plantanaceae.....	1	1	1	1	1	1	1	1	...	1	...	...	...	...	...	...
Juglandaceae.....	8	7	6	7	7	4	7	...	...	2	...	...	...	...	...	...
Cupuliferae.....	12	11	11	11	12	9	11	5	...	3	...	...	...	...	...	...
Salicaceae.....	13	13	12	12	13	3	4	5	7	5	4	1	1	2	2	3
Coniferae.....	2	2	1	2	2	1	1	1	1	1	1	1	1	2	...	1
Araceae.....	5	5	5	5	5	5	4	1	...	...	...	...	...	...	...	...
Lemnaceae.....	4	3	4	4	4	2	3	3	3	3	3	2	2	3	...	...
Typhaceae.....	2	2	2	2	2	1	1	2	1	1	2	1	2	2	...	1
Najadaceae.....	6	6	6	6	6	5	5	4	3	5	4	3	3	4	...	...
Alismaceae.....	7	6	6	6	6	4	3	5	4	2	4	3	3	4	2	2
Hydrocharidaceae.....	2	2	2	2	2	2	1	...	...	...	...	...	...	1	...	...
Orchidaceae.....	16	16	14	15	16	7	8	5	5	1	1	...	2	1	1	1
Amaryllidaceae.....	1	1	1	1	1	1	1	1	1	...	...	...	...	...	...	...
Iridaceae.....	2	2	2	2	2	2	2	2	...	1	1	1	1	...	1	...
Dioscoreaceae.....	1	1	1	1	1	1	1	1	...	...	...	...	...	...	...	...
Smilacaceae.....	2	2	2	2	2	1	2	1	...	...	...	...	...	...	...	...
Liliaceae.....	13	12	10	10	12	3	7	7	4	3	3	2	3	3	...	1
Juncaceae.....	4	4	4	4	4	2	3	2	2	2	1	2	2	2	...	...
Pontederaceae.....	2	2	2	2	2	2	2	2	1	...	1	...	...	...	...	...
Commelynaceae.....	2	1	1	1	1	2	2	1	...	1	1	...	...	...	...	...
Cyperaceae.....	78	70	66	74	76	43	41	38	20	26	10	13	15	23	5	3
Gramineae.....	70	63	56	61	66	41	45	41	33	20	23	17	6	11	6	5
Equisetaceae.....	7	5	4	5	6	1	1	5	5	4	3	3	3	1	1	2
Filices.....	16	15	16	16	16	15	11	7	5	3	4	5	5	4	5	2
Ophioglossaceae.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	...	...
Lycopodiaceae.....	1	1	1	1	1	1	1	1	...	...	...	...	...	...	...	...
Hydropterides.....	1	1	1	1	1	1	1	1	...	1	...	...	...	...	...	...
Dicotyledoneae.....	592	479	450	512	543	334	443	338	201	202	108	88	88	118	31	32
Monocotyledoneae.....	217	198	184	198	208	124	130	114	76	66	54	44	39	54	15	13
Cryptogamae vasculares	26	23	23	24	25	19	15	14	11	9	8	9	9	6	6	4
	835	700	657	734	776	477	588	466	288	277	170	141	136	178	52	49

PLANTS OF THE ILLINOIS FLORA, BUT SO FAR  
NOT FOUND NEAR PEORIA.

[S.—Southward. N.—Northward, W.—Westward.

**Ranunculaceæ.**

- S. *Clematis viorna* L.  
N. *Anemone patens* L. var. *Nuttalliana*.  
N. *A. nemorosa* L.  
Ranunculus *divaricatus* Schrank.  
R. *aqualilis* L. var. *trichophyllus*.  
S. *R. alismaefolius* Geyer.  
S. *R. oblongifolius* Ell.  
N. *R. rhomboideus* Goldie.  
R. *pennsylvanicus* L.  
S. *Myosurus minimus* L.  
S. *Trautvetteria palmata* Fisch. and Mey.  
W. *Delphinium azureum* Michx.  
S. *Cimicifuga racemosa* Ell.

**Magnoliaceæ.**

- S. *Liriodendron tulipifera* L.

**Nymphaeaceæ.**

- Brasenia peltata* Ph.

**Sarraceniaceæ.**

- N. *Sarracenia purpurea* L.

**Papaveraceæ.**

- S. *Stylophorum diphyllum* Nutt.

**Fumariaceæ.**

- N. *Adlumia cirrhosa* Raf.  
N. *Dicentra canadensis* D. C.  
N. *Corydalis glauca* Ph.

**Cruciferæ.**

- S. *Nasturtium obtusum* Nutt.  
N. *Arabis lyrata* L.  
A. *hirsuta* Scop.  
N. *A. perfoliata* Lam.  
N. *A. Drummondii* Gr.  
S. *A. Ludoviciana* Mey.  
N. *Barbarea vulgaris* R. Br.  
*Erysimum cheiranthoides* L.  
E. *asperum* D. C. var. *Arkansanum*.  
S. *Draba cuneifolia* Nutt.  
*Lepidium intermedium* Gr.

**Violaceæ.**

- N. *Viola lanceolata* L.  
N. *V. blanda* Willd.  
*V. canina* L. var. *sylvestris*.  
*V. striata* Ait.  
*V. tricolor* L. var. *arvensis*.

**Cistaceæ.**

- N. *Hudsonia tomentosa* Nutt.

**Hypericaceæ.**

- S. *Ascyrum crux Andreæ* L.  
S. *H. proliferum* L.  
S. *H. adpressum* Bart.  
S. *H. ellipticum* Hook.  
S. *H. Drummondii* T. Gr.  
H. *mutilum* L.  
H. *canadense* L.  
H. *sarothra* Michx.

**Elatinaceæ.**

- S. *Elatine americana* Arnott.  
S. *Bergia Texana* Seubert.

**Caryophyllaceæ.**

- Silene virginica* L.  
S. *S. regia* Sims.  
S. *Sagina apetala* L.  
N. *Stellaria crassifolia* Ehrh.  
N. *Arenaria stricta* Michx.  
*Cerastium oblongifolium* Torr.

**Portulacaceæ.**

- W. *Claytonia caroliniana* Michx.  
N. *Talinum teretifolium* Ph.

**Malvaceæ.**

- S. *Hibiscus Moscheutos* L.  
S. *H. grandiflorus* Michx.  
N. *Sphaeralcea acerifolia* Nutt.

**Tiliaceæ.**

- S. *Tilia heterophylla* Vent.

**Linaceæ.**

- Linum virginianum* L.  
S. *L. striatum* Walt.

**Geraniaceæ.**

- Geranium carolinianum* L.

**Illicineæ.**

- Ilex verticillata* Gr.  
S. *I. decidua* Walt.

**Anacardiaceæ.**

- Rhus typhina* L.  
*R. copallina* L.  
N. *R. venenata* DC.

**Vitaceæ.**

- S. *Vitis indivisa* Willd.  
S. *V. bipinnata* TGr.

**Rhamnaceæ.**

- S. *Frangula caroliniana* Gr.  
N. *Ceanothus ovalis* Big.

**Celastraceæ.**

- Euonymus americanus* L.

**Sapindaceæ.**

- S. *Acer rubrum* L.

**Polygalaceæ.**

- Polygala ambigua* Nutt.  
*P. polygama* Walt.  
N. *P. cruciata* L.  
N. *P. pauciflora* Willd.

**Leguminosæ.**

- N. *Lupinus perennis* L.  
*Trifolium stoloniferum* Muhl.  
N. *Petalostemon foliosus* Gr.  
S. *Psoralea melilotoides* Michx.  
S. *Dalea alopecuroides* Willd.  
S. *Robinia pseudacacia* L.  
S. *Wistaria frutescens* DC.  
S. *Astragalus mexicanus* ADC.  
S. *A. distortus* TGr.  
N. *A. platensis* Nutt var *Tennesseeensis*.  
S. *Desmodium rotundifolium* DC.  
S. *D. laevigatum* DC.  
S. *D. viridiflorum* Beck.  
S. *D. rigidum* DC.  
S. *D. ciliare* DC.  
S. *D. marilandicum* DC.  
S. *Lespedeza repens* TGr.  
S. *L. hirta* Ell  
S. *Stylosanthes elatior* Sw.  
S. *Phaseolus perennis* Walt.  
*Ph. pauciflorus* Benth.  
S. *Clitoria Mariana* L.  
S. *Galactia mollis* Michx.  
N. *Vicia caroliniana* Walt.  
N. *Lathyrus venosus* Muhl.  
N. *L. ochroleucus* Hook.  
N. *Baptisia tinctoria* RBr.  
S. *Cassia nictitans* L.  
S. *Gleditschia monosperma* Walt.

**Rosaceæ.**

- N. *Prunus pumila* L.  
N. *P. pennsylvanica* L.  
*Neillia opulifolia* Benth, Hook.  
*Spiræa salicifolia* Raf.

- N. *Sp. tomentosa* L.  
*Geum strictum* Ait.  
S. *G. vernum* TGr.  
N. *G. macrophyllum* Willd.  
N. *G. rivale* L.  
N. *G. triflorum* Ph.  
*Fr. garia vesca* L.  
S. *Gillenia stipulacea* Nutt.  
S. *Poterium canadense* Gr.  
S. *Potentilla paradoxa* Nutt.  
N. *P. fruticosa* L.  
N. *P. palustris* L.  
*Rubus strigosus* Michx.  
*R. canadensis* L.  
N. *R. triflorus* Rich.  
N. *R. hispidus* L.  
S. *Crataegus arborescens* Ell.  
S. *Pyrus angustifolia* Ait.  
N. *P. arbutifolia* L.

**Saxifragaceæ.**

- N. *Ribes cynosbati* L.  
N. *R. hirtellum* Michx.  
S. *Saxifraga Forbesii* Vasey.  
S. *Heuchera americana* L.  
S. *H. Rugelii* Shuttl.

**Crassulaceæ.**

- Sedum ternatum* Michx.  
S. *S. pulchellum* Michx.

**Hamameliaceæ.**

- S. *Liquidambar styraciflua* L.

**Haloragaceæ.**

- Myriophyllum verticillatum* L.  
*M. heterophyllum* Michx.  
*M. scabratum* Michx.  
N. *M. spicatum* L.  
N. *Hippuris vulgaris* L.

**Onagraceæ.**

- N. *Epilobium angustifolium* L.  
*E. molle* Torr.  
S. *Oenothera linearis* Michx.  
S. *Oe. missouriensis* Sims.  
*Ludwigia sphaerocarpa* Ell.

**Melastomaceæ.**

- Rhexia virginica* L.

**Lythraceæ.**

- Peplis diandra* Nutt.  
S. *Decodon verticillatus* Ell.

**Loasaceæ.**

- S. *Mentzelia oligosperma* Nutt.

**Cactaceæ.**

- Opuntia Rafinesquii* Engelm.

- Passifloreæ.**  
*S.* *Passiflora lutea* L.
- Umbelliferae.**  
*S.* *Sanicula canadensis* L.  
*Polytaenia Nuttallii* DC.  
*S.* *Discopleura Nuttallii* DC  
*N.* *Conioselinum canadense* T. Gr.  
*Eulophus americanus* Nutt.  
*S.* *Archangelica hirsuta* T. Gr.  
*S.* *Erigenia bulbosa* Nutt.
- Araliaceae.**  
*S.* *Aralia spinosa* L.
- Cornaceae.**  
*N.* *Cornus canadensis* L. ^  
*S.* *C. florida* L.  
*S.* *Nyssa multiflora* Wang.
- Caprifoliaceae.**  
*Symphoricarpos occidentalis* R.Br.  
*S.* *S. vulgaris* Michx.  
*N.* *Diervilla trifida* Moench.  
*N.* *Viburnum pubescens* Ph.  
*N.* *V. acerifolium* L.  
*S.* *Triosteum angustifolium* L.
- Rubiaceae.**  
*Galium asprellum* Michx.  
*S.* *G. pilosum* Ait.  
*N.* *G. boreale* L.  
*S.* *Diodia virginica* L.  
*S.* *D. teres* Walt.  
*S.* *Mitchella repens* L.  
*Houstonia coerulea* L.  
*S.* *H. angustifolia* Michx.  
*S.* *H. minima* Beck.
- Valerianaceae.**  
*Fedia radiata* Michx.  
*N.* *F. umbilicata* Sull.  
*N.* *Valeriana edulis* Nutt.  
*S.* *V. pauciflora* Michx.
- Compositae.**  
*W.* *Vernonia noveboracensis* Willd.  
*S.* *Elephantopus carolinianus* Willd.  
*Liatris squarrosa* Willd.,  
*N.* *L. spicata* Willd.  
*S.* *Eupatorium aromaticum* L.  
*S.* *Eu. celestinum* L.  
*S.* *Aster patens* Ait.  
*S.* *A. turbinellus* Lindl.  
*A. undulatus* L.  
*A. dumosus* L.  
*N.* *A. acuminatus* Michx.  
*A. ptarmicoides* TGr.
- S.* *Boltonia diffusa* L'Her.  
*Solidago bicolor* L.  
*S. caesia* L.  
*N.* *S. stricta* Ait.  
*S.* *S. petiolaris* Ait.  
*S. altissima* L.  
*S.* *S. Drummondii* TGr.  
*S. Radula* Nutt.  
*S.* *Pluchea foetida* DC.  
*S.* *Polymnia Uvedalia* L.  
*S.* *Chrysogonum virginianum* L.  
*S.* *Rudbeckia speciosa* Wender.  
*S.* *Helianthus atrorubens* L.  
*S.* *H. mollis* Lam.  
*S.* *H. microcephalus* TGr.  
*S.* *Coreopsis auriculata* L.  
*C. trichosperma* Michx.  
*S.* *C. discoidea* TGr.  
*N.* *Bidens cernua* L.  
*B. Beckii* Torr.  
*S.* *B. bipinnata* L.  
*Verbesine virginica* L.  
*S.* *Hymenopappus scabiosaens* L'Her.  
*N.* *Actinella scaposa* Nutt.  
*S.* *Leptopoda brachypoda* TGr.  
*S.* *Matricaria discoidea* DC.  
*N.* *Artemisia dracunculoides* Ph.  
*N.* *A. serrata* Nutt.  
*S.* *Senecio lobatus* Pers.  
*S.* *Cnicus virginianus* var *filipendulum* Ph.  
*S.* *Krigia virginica* Don.  
*S.* *K. Dandelion* Nutt.  
*Hieracium Gronovii* L.  
*N.* *H. canadense* Michx.  
*Prenanthes altissimus* Hook.  
*Lactuca leucophaea* Gr.
- Lobeliaceæ,**  
*S.* *Lobelia puberula* Michx.
- Campanulaceæ,**  
*Campanula rotundifolia* L.  
*S.* *C. divaricata* Michx.
- Ericaceæ,**  
*N.* *Vaccinium macrocarpum* Ait.  
*N.* *V. pennsylvanicum* Lam.  
*N.* *V. canadense* Kalm.  
*N.* *V. corymbosum* L.  
*S.* *V. arboreum* Marsh.  
*N.* *Andromeda polifolia* L.  
*N.* *Pyrola elliptica* Nutt.  
*N.* *P. chlorantha* Sw.  
*Chimaphila umbellata* Nutt.

**Primulaceæ,**

- Lysimachia stricta Ait.  
S. Centunculus minimus L.

**Sapotaceæ,**

- S. Bumelia lanuginosa Pers.

**Oleaceæ,**

- S. Forestiera acuminata Poir

**Asclepiadaceæ.**

- S. Asclepias perennis Walt.  
A. variegata L.  
N. A. ovalifolia Descaine.  
N. Acerates lanuginosa Descaine.  
Asclepiodora viridis Gr.  
S. Ensenia albida Nutt

**Loganiaceæ.**

- S. Spigelia maritandica L.

**Gentianaceæ.**

- N. Gentjana crinita Froel.  
N. G. detonsa Walt.  
N. G. saponaria L.  
S. Sabbatia angularis Ph.  
N. Bartonía tenella Muhl.  
S. Fräsera carolinensis Walt.

**Polemoniaceæ.**

- S. Phlox paniculata L.  
S. Ph. stellaria Gr.

**Hydrophyllaceæ.**

- Hydrophyllum canadense L.  
S. Ph. bipinnatifida Michx.

**Borraginaceæ.**

- S. Cynoglossum virginicum L.  
S. Heliotropium curassavicum L.

**Convolvulaceæ.**

- W. Breweria Pickeringii Gr.  
S. Cuscuta decora Choix.

**Solanaceæ.**

- Physalis pubescens L.  
Ph. philadelphica Lam.  
S. Ph. angulata L.

**Scrophulariaceæ.**

- Linaria canadensis Spr.  
Collinsia verna Nutt.  
Chelone obliqua L.  
Pentstemon laevigatus Sol. var.  
digitalis Gr.  
W. P. grandiflorus Fraser.  
S. Mimulus alatus Ait.  
S. Herpestes rotundifolia Ph.

- S. Gratiola sphaerocarpa Ell.  
Synthyris Houghtoniana Benth.  
S. Veronica serpyllifolia L.  
S. Buchnera americana L.  
Gerardia Skinneriana Wood.  
G. quercifolia Ph.  
G. pedicularis L.  
S. G. flava L.  
S. G. laevigata Raf.  
N. Castilleja sessiliflora Ph.

**Orobanchaceæ.**

- S. Conopholis americana Wallr.  
S. Aphyllon ludovicianum Gr.

**Lentibulariaceæ.**

- Utricularia biflora Lam.  
• U. gibba L.  
N. U. minor L.

**Bignoniaceæ.**

- S. Bignonia capreolata L.

**Acanthaceæ.**

- Dianthera americana L.

**Verbenaceæ.**

- Verbena angustifolia Michx.

**Labiataæ.**

- Trichostema dichotomum L.  
S. Cunila Mariana L.  
S. Pycnanthemum incanum Michx.  
N. Calamintha Nuttallii Benth.  
Hedeoma hispida Ph.  
S. Collinsonia canadensis L.  
S. Salvia lyrata L.  
S. Monarda Bradburiana Beck.  
M. punctata L.  
Blephilia ciliata Raf.  
S. Synandra grandiflora Nutt.  
S. Scutellaria canescens Nutt.  
Stachys cordata Ridd.  
St. hyssopifolia Michx., var am-  
bigua Gr.

**Plantaginaceæ,**

- S. Plantago pusilla Nutt.  
S. P. patagonica Jacq., var aristata.

**Aristolochiaceæ,**

- S. Aristolochia tomentosa Sims.

**Chenopodiaceæ,**

- W. Cycloloma platyphyllum Mocq.  
N. Blitum capitatum L.  
Atriplex patula L.

**Amarantaceæ,**

- S. Froelichia floridana Mocq.



**Polygonaceæ,**

- Polygonum Hartwrightii Gr.  
P. articulatum L.  
P. arifolium L.

**Lauraceæ,**

- Lindera Benzoin Meisner.

**Loranthaceæ,**

- S. Phoradendron flavescens Nutt.

**Callitrichaceæ,**

- S. Callitriche Austini Engelm.  
S. C. auctumnalis L.

**Euphorbiaceæ,**

- Euphorbia Geyeri Engelm.  
Eu. glyptosperma Engelm.  
S. Eu. serpens HBK.  
S. Eu. humistrata Engelm.  
S. Croton capitatus Michx.  
S. Cr. monanthogynus Michx.  
S. Crotonopsis linearis Michx.  
S. Phyllanthus carolinensis Walt.

**Urticaceæ.**

- N. Ulmus racemosa Thomas.  
S. U. alata Michx.  
S. Celtis mississippiensis Bosc.

**Cupuliferæ.**

- Quercus stellata Wang.  
Qu. palustris DuRoi.  
S. Qu. falcata Michx.

**Betulaceæ.**

- Alnus serrulata Ait.  
Betula nigra L.  
N. B. papyracea.  
N. B. lenta L.  
N. B. pumila L.

**Myricaceæ,**

- N. Comptonia asplenifolia Ait.

**Salicaceæ,**

- Salix lucida Muhl.  
N. S. rostrata Rich.  
S. Populus heterophylla L.

**Coniferæ,**

- N. Pinus Banksiana Lamb.  
N. P. strobus L.  
S. P. mitis Michx.  
N. Larix americana Michx.  
N. Juniperus communis L.  
N. Taxus baccata L., var canadensis.

**Lemnaceæ,**

- S. Wolffia Brasiliensis Weddell.

**Typhaceæ,**

- N. Sparganium simplex Hudson.

**Najadaceæ,**

- S. Potamogeton Claytoni Tuck.  
S. P. pulcher Tuck.  
N. P. Vaseyi Robbins.  
N. P. spirillus Tuck.  
P. hybridus Michx.  
N. P. rufescens Schrad.  
N. P. Lonchites Tuck.  
P. gramineus L.  
P. lucens L.  
N. P. perfoliatus L.  
P. compressus L.

**Alismaceæ,**

- Scheuchzeria palustris L.  
Sagittaria graminea Michx.  
S. Echinodorus parvulus Engelm.  
S. E. radicans Engelm.

**Orchidaceæ,**

- N. Habenaria viridis Spr., var bracteata.  
H. psychodes Gr.  
S. H. peramoena Gr.  
N. Goodyera pubescens RBr.  
S. Spiranthes latifolia Torr.  
N. Pogonia ophioglossoides Nutt.  
N. Microstylis monophyllos Lindl.  
S. M. ophioglossoides Nutt.  
S. Corallorhiza multiflora Nutt.

**Amaryllidaceæ**

- S. Pancratium rotatum Ker.  
S. Agave virginica L.

**Haemodoraceæ,**

- Aletris farinosa L.

**Smilacaceæ,**

- S. Smilax rotundifolia L.  
S. S. glauca Walt.  
S. S. tannoides L.

**Liliaceæ,**

- Trillium sessile L.  
Tr. grandiflorum Salisb.  
N. Tr. cernuum L.  
Melanthium virginicum L.  
N. Zygadenus glaucus Nutt.  
S. Stenanthium angustifolium Gr.  
W. Veratrum Woodii Robbins.  
Chamaelirium luteum Gr.  
N. Toffieldia glutinosa Willd.  
Uvularia perfoliata L.  
N. Smilacina trifolia Desf.  
N. S. bifolia Ker.  
Polygonatum biflorum Ell.  
Lilium canadense L.

- N. *Erythronium americanum* Sm.  
 N. *Allium cernuum* Roth  
 W. *A. stellatum* Nutt.  
 S. *A. striatum* Jacq.

**Juncaceæ.**

- Luzula campestris* DC.  
*Juncus effusus* L.  
*J. marginatus* Rostk.  
*J. bufonius* L.  
 N. *J. Greenii* Oakes & Tuck.  
 N. *J. Vaseyi* Engelm.  
 N. *J. alpinus* var *insignis* Engelm.  
 S. *J. acuminatus* var *robustus* Engelm.  
 S. *J. acuminatus* var *debilis* Engelm.  
*J. brachycarpus* Engelm.  
 N. *J. canadensis* var *longicaudatus* Engelm.  
 N. *J. canadensis* var *coarctatus* Engelm.

**Commelynaceæ.**

- S. *Commelina virginica* L.  
 S. *Tradescantia pilosa* Lehm.

**Xyridaceæ,**

*Xyris flexuosa* Muhl.

**Cyperaceæ,**

- S. *Cyperus Engelmanni* Steud.  
*C. Schweinitzii* Torr.  
 S. *Kyllingia pumila* Michx.  
 S. *Eleocharis quadrangulata* RBr.  
 S. *E. rostellata* Torr.  
 S. *E. Engelmanni* Steud.  
 W. *E. Engelmanni* var *detonsa* Gr.  
 N. *Scirpus pauciflorus* Lightf.  
 N. *S. caespitosus* L.  
 S. *S. debilis* Pursh.  
 S. *S. supinus* var *Hallii* Gr.  
*S. fluviatilis* Gr.  
 S. *S. polyphyllus* Vahl.  
*S. Eriophorum* Michx.  
 N. *Eriophorum polystachyon* L.  
*Fimbristylis spadicea* var *castanea* Gr.  
*F. laxa* Vahl.  
*F. capillaris* Gr.  
*Rhynchospora cymosa* Nutt.  
*R. capillacea* Torr.  
 N. *R. glomerata* Vahl.  
 N. *Cladium mariscoides* Torr.  
*Carex siccata* Dew.  
*C. decomposita* Muhl.  
*C. Muhlenbergii* Schk.

- S. *C. retroflexa* Muhl.  
 N. *C. chordorhiza* Ehrh.  
 N. *C. Bebbii* Olney.  
 S. *C. foenea* Willd.  
 N. *C. aquatilis* Wahl.  
*C. aperta* Boot.  
*C. crinita* Lam.  
 N. *C. panicea* var *Bebbii* Olney.  
*C. tetanica* Schk.  
*C. conoidea* Schk.  
 S. *C. virescens* Muhl.  
 S. *C. plantaginea* Lam.  
 S. *C. Careyana* Torr.  
 N. *C. platyphylla* Carey.  
 N. *C. retrocurva* Dew.  
 N. *C. pedunculata* Muhl.  
 S. *C. debilis* Michx.  
 N. *C. Ederi* Ehrh.  
 S. *C. stenolepis* Terr.  
*C. retrorsa* Schw.  
*C. utriculata* Boot.  
 N. *C. Tuckermani* Boot.  
*C. bullata* Schk.

**Gramineæ,**

- Vilfa virginica* Beauv.  
 N. *Sporobolus cryptandrus* Gr.  
*Ammophila longifolia* Benth.  
 S. *Aristida dichotoma* Michx.  
 S. *A. ramosissima* Engelm.  
 S. *A. gracilis* Ell.  
 S. *A. stricta* Michx.  
*A. oligantha* Michx.  
*A. purpurascens* Poir.  
*A. tuberculosa* Nutt.  
 W. *Bouteloua hirsuta* Lag.  
 N. *B. oligostachya* Torr.  
 S. *Diplachne fascicularis* Benth.  
*Triplasis purpurea* Chap.  
 N. *Glyceria canadensis* Trin.  
 W. *Poa alsodes* Gr.  
*Eragrostis tenuis* Gr.  
 S. *Uniola latifolia* Michx.  
 S. *Lepturus paniculatus* Nutt.  
 N. *Triticum repens* L.  
 N. *T. caninum* L.  
*Trisetum palustre* L.  
 N. *Hierochloa borealis* R Sch.  
 N. *Milium effusum* L.  
 S. *Paspalum fluitans* Kth.  
 S. *P. walterianum* Schult.  
*P. setaceum* Michx.  
 S. *P. laeve*, Michx.  
*Panicum filiforme* L.

- S. *F. microcarpon* Muhl.
- S. *Tripsacum dactyloides* L.
- S. *Erianthus saccharoides* Michx.
- Andropogon dissitiflorus* Michx.

**Equisetaceæ.**

- N. *Equisetum scirpoides* Michx.

**Filices.**

- Polypodium vulgare* L.
- S. *P. incanum* Sw.
- S. *Cheilanthes vestita* Sw.
- W. *Ch. lanuginosa* Nutt.
- N. *Pellaea gracilis*, Hook.
- P. atropurpurea* Link.
- S. *Asplenium pinnatifidum* Nutt.

- S. *A. Trichomanes* L.
- A. ebeneum* Ait.
- S. *Phegopteris polypodioides* Fee.
- Aspidium Noveboracense* Sw.
- A. Goldianum* Hook.
- A. marginale* Sw.
- S. *Woodsia obtusa* Torr.
- N. *W. Ilvesis* R Br.
- Osmunda cinnamomea* L.

**Lycopodiaceæ.**

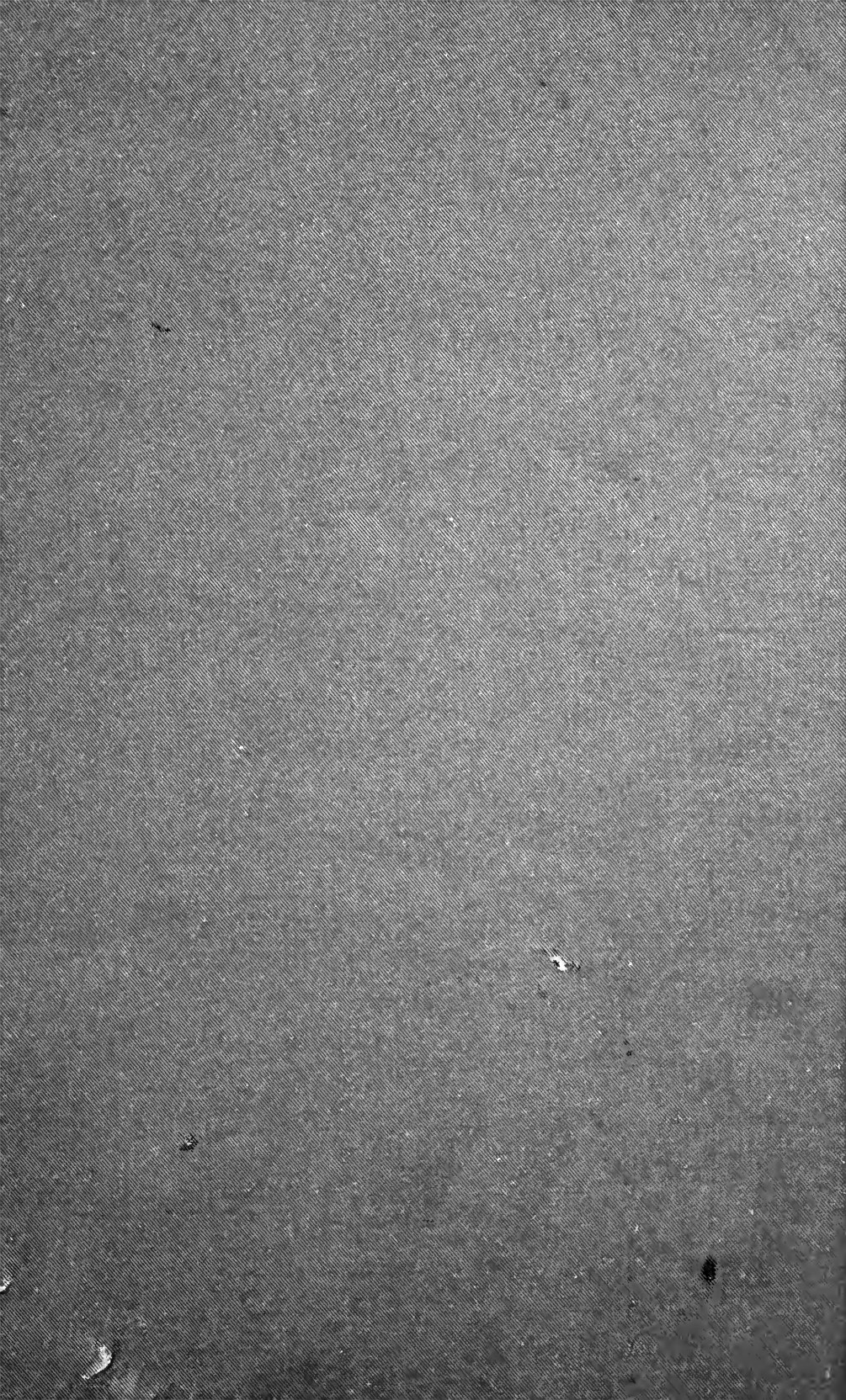
- N. *Lycopodium lucidulum* Michx.
- N. *L. Selago* L.
- N. *Selaginella rupestris* Spring.
- Isoetes melanopoda* Gay.













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