

THE TREES AND SHRUBS IN ILLINOIS.

BY FREDERICK BRENDAL, of Peoria.

"Welcome, ye shades ! ye bowery thickets hail !
Ye lofty pines ! ye venerable oaks !
Ye ashes wild, resounding o'er the steep !
Delicious is your shelter to the soul."

THOMSON.

It is a singular charm, to roam in a mighty forest, now below the green dome of transparent foliage, the lofty home of a melodious chorus, diffusing a magic light over the flower-covered ground; now below the darker shelter of a thick, leafy roof, where the mossy stone checks the murmuring rivulet, or the woodpecker's monotonous thump only interrupts the solemn silence.

Upward winds our path; we proceed to the platform of a steep rock. How delightful a scene opens to our view below! The rocky walls rise above an ocean of manifold shaped foliage, resplendent in fall-time with a variety of brilliant different colors and shades; a broad stream winds through the valley, reflecting on its silvery sheet the forms of the bordering willows or the houses of a peaceful village, or the smoking factories of a noisy city, on the background of which stretches the wide prairie, crossed by roads and checkered with farms and small groves. The horizon bounds a line of wooded bluffs. Everywhere a variety of points for the eye to rest on. A treeless plain fatigues the eye; a wilderness of naked rocks arouses gloomy sentiments; but the woods embellish the landscape as the curling hair does the child's blooming face.

To rob a country of this ornament, manifests a want of good taste. To destroy entire forests of useful trees proves an abundance of damnable heedlessness, which does not care about the future, and has been repented in many cases, when it was too late.

Every farmer should not only reserve a portion of good timber on his lands, but improve it by introduction of useful trees. Improved woodland will bring yearly a good rent to a wise economist. This has often been taught, but cannot be repeated often enough.

It is not my intention to give a systematical description of all our trees and shrubs. That can be found in any manual of botany, (particularly in Asa Gray's Botany of the Northern States.) Here it will

be sufficient to present a review of those species of woody plants, which constitute our woods, which with certainty can and which possibly might be found in each part of our state. Perhaps there is in every county one man, who takes so much interest in the physical exploration of the country he lives in, to make himself the trouble to compile a catalogue of the surrounding vegetation, with additional notes about the soil, the time of leafing, flowering, fruiting, shedding of leaves. Specimens about which anybody is in doubt, to examine I am ready any time. So we could in a couple of years easily finish the work, of which the foundation Mr. Lap- ham has laid in the second volume of these Transactions.

In a state like that of Illinois, the principal resources of which agriculture furnishes, a botanical survey is of no less importance than a geological survey. The riches which the fertile soil offers are worth to be known as much as those which the underlaying strata cover. The spontaneous vegetation of a soil indicates exactly its quality. Some specimens of plants possess qualities which are little known, but of a high value. How many do not know that the white willow, (*salix alba*, L.) furnishes the best and most durable fence posts. It has a rapid growth, obtains a considerable size and can be cultivated throughout the state. Many species growing spontaneously in any locality indicate that other species of any value, which like the same soil and climate, could be introduced and cultivated. Quite a number of advantages could be counted, which, though not so obvious to the first sight, would arise from a botanical exploration of the whole state.

GEOGRAPHICAL DISTRIBUTION OF WOODY PLANTS IN ILLINOIS.—The bulk of the woodland in Illinois occupies the southern portion of the state. In middle Illinois woodland and prairie are equally distributed. In the northern part (except Jo Daviess county,) the prairie prevails, the river bottoms only being wooded. Entirely destitute of woods are large tracts of land around the sources of Kaskaskia river, and the other left tributaries of the Illinois river, and the right tributaries of the Wabash river, in Livingston, Iroquois and Vermilion counties. Then between the Illinois river and Rock river. What is the reason of this want of trees over such large tracts of land? It is not sterility of the soil. The soil of our prairies possesses all those materials the growth of trees needs. Nor is it want of humidity, nor the violence of storms which sweep the plains. Though hurricanes occasionally prostrate trees of the largest size, they would not hurt the bending young tree, once having occupied the ground. The prairie fires we could accuse of destruction, provided there were no previous cause to acquit the fire from that crime.

In middle Illinois we generally find the bottom lands and bluffs covered with wood, because the action of running water makes the soil more loose and prevents the herbaceous perennials covering it with a thick tuft, so the seeds of trees can easily germinate and grow. On the table land the grasses have preoccupied the soil,

and their fibrous and manifold intricate roots, their tufted growth, prevent the seeds of trees, when transplanted by the wind, to germinate and take root. It is the victorious struggle of the pigmean army of united grasses against the mighty giants of the forest, who, like Antæus, get their strength only by footing on the ground, and who need the assistance of men to take possession of that ground.

How useful and how much needed the cultivation of forest trees in the prairie districts is, and how trees can be transplanted and cultivated, has been taught more than once in the two first volumes of these Transactions, by many an expert farmer, and it will be sufficient here to refer the reader to the same.

The American forest surpasses the European in a far greater variety of species growing in company; and this variety of different forms and colors, especially in fall, gives to the wooded districts a surprising appearance. Though the different species prefer different soil, exposition, humidity, etc., and many species are wanting in localities where others abound, we can easily find twenty to thirty different trees or shrubs upon a few acres of land. Along river banks we find, besides various willows, the cottonwood, the white elm, the sycamore, the silver-leaved maple; on rich bottom land the burr oak, the swamp white oak, the pecan nut, the black walnut, the butter nut, the hackberry, the ashes, the red maple, the box'elder, the buckeye, the honey locust, the Kentucky coffee tree, the papaw, the red mulberry; higher up the bluffs the shell-bark hickory, the bitternut hickory, the mockernut, the white oak, the chestnut oak, the red oak, the black oak, the laurel oak, the water beech, the iron wood, the sassafras, the red bud, the basswood and the red cedar. Exclusively in swamps we find the American arbor vitæ. The two latter trees belong to the family of

THE CONIFERÆ.—This family includes all those trees and shrubs which present the appearance of the pine. It differs from other woody plants chiefly by their naked seeds at the base of either tree or berry-like coalescent scales—their mostly persistent needle-shaped stiff leaves, and their resinous wood having no ducts, but consisting of a homogeneous fibre with circular disks on two opposite sides. One thing more distinguishes this family from many other trees—that the individual cannot be reproduced by layers, nor by shoots from the root.

A. Braun published six years ago some interesting observations on the development of the embryo and young plants of the Scotch pine, the Norway spruce, the European silver fir and the larch.

The albumen, containing oil and amylum, envelops the embryo, which consists of a long straight cylindrical axis and at least four cotyledons (five to nine in the spruce and fir, generally six in the pine.) The seeds of these coniferous trees germinate, when the weather is warm and moist, in ten to fourteen days—the fir in the beginning of May—the spruce, pine and larch in the last part of

May and the first part of June. The radicle pierces the integument the first, and when the albumen is consumed, the integument is thrown off and the cotyledons get their green color. The youngest plants are distinguished by the direction of the green cotyledons. The cotyledons of the fir, which has the largest embryo, are arranged in a horizontal verticil around the axis. The fir produces the first year rarely more than one verticil of leaves, which alternate with the cotyledons. The spruce turns the cylindrical cotyledons all to one side—the pine and larch keep the same straight upward. The root of all ramifies very early. The pine, which has the leaves in two, produces the first year only single leaves, with only two resinous channels, from the axils of which, in the second year, sprout the twin leaves, with many (to 24) resinous channels, of which the leaves of the other species have always only two. The larch has the two first years single leaves, and not before the third year appear the fascicles. The cotyledons of the coniferous trees serve at first as nourishment for the young plants; afterwards they have the function of leaves; those of the fir last several years; those of the other three species wither the first year. I had not yet the chance to make similar observations on our American species. Perhaps one or the other of our readers will communicate his experience in this line.

In Illinois we find only six species of this family, never forming large forests, but single or in small groups. Two belong to the proper pine family (genus *Pinus*, sub-genus *pinaster* and *strobos*.) One of both is only a shrub, or a small tree. The gray or northern scrub pine (*Pinus Banksiana*, Lamb;) rarely found in only one locality in Ogle county, as I am assured by Mr. Bebb. The same gentleman informs me, that the other of the above species, the white pine, (*P. strobus*, L.,) is very frequent in the northern part of Illinois.

Three species belong to the cypress family—the American arbor vitæ, (*Thuja occidentalis*, L.,) the red cedar, (*Juniperus Virginiana*, L.,) and the bald cypress, (*Taxodium distichum*, Rich.)—the latter, in the southern states, a very large sized tree, and, by its durability, most valuable as timber; grows in the southern part of Illinois, but not to so large a size. This tree has a wide geographical extension. It grows in Mexico, on the table land, in a height of between 5400 and 7200 feet above the level of the sea, as well as in the swamps of the Mississippi, and all over the southern states, and attains a height of 120 feet, and near the base a diameter of 30 to 37 feet.—(Emerson Rep. on the Forests.) The roots of this tree present a very remarkable appearance of woody excrescences, of a rounded or conic or a table form, 3 to 4½ feet, prominent from the ground, which is probably the reason for the Mexican name—*Ahuahuete*,—which means water drum. These excrescences of the bald cypress can be regarded as exostoses, and, as they live in the open air, no doubt there would be an issue of shoots, if not the nature of the tissue of the coniferous trees were

opposed to the development of germs, which generally produce such shoots. (St. Hilaire Morph Veget.) Brongniart has described two more species of this genus: *Taxodium microphyllum* and *Taxodium ascendens*. The latter is *Cupressus disticha*, B. imbricaria, Nutt.; both in the southern states, but perhaps both only varieties.

The red cedar, (*Juniperus Virginiana*, L.) extends from the Gulf of Mexico to 50 deg. N. L.—the variety *humilis*, even to 68 deg. N. L., where Richardson found it,—and from the Atlantic, beyond the Rocky mountains. This tree becomes 20 to 30 feet high and likes rocky and dry hills, where its sombre appearance between the young green of other trees in spring presents a delightful contrast.

The American arbor vitæ, on the contrary, prefers the swamps. It is easily recognized by the compressed branchlets and recurved branches; it is said to attain sometimes a height of 50 feet, but I never have seen it so large, and always only single specimens; but northward, extending to 50 deg. N. L., it forms the so called Cedar Swamps.

THE YEW FAMILY, (*Taxinæ*) is represented in Illinois only by one species—the American yew or ground hemlock, (*Taxus canadensis*, Willd.) It is a shrub not over eight feet high, occurring on moist rocks and river banks. Mr. Bebb has found it, but not frequent, in Winnebago county, and I have seen it in St. Clair county, (if I recollect right,) on the steep, springy bluffs, opposite St. Louis, at a place called Falling Spring. This is a northern species, and extends to 54 deg. N. L., and westward to Oregon. The European species, (*Taxus baccata*, L.) of which this seems to be a variety, becomes a tree, but occurs wild only in mountainous districts of Europe.

Endlicher's *Synopsis Coniferarum*, 1847, contains 312 actual and 178 extinct species—the latter, except three species, all detected in Europe, only one, (*Peuce Americana*, Unger,) in North America, (Illinois and Ohio;) it is not said in which formation, but probably in the carboniferous—the lowest that contains this family, and to which 17 of the above species belong. This number could probably be much increased by an attentive examination of our coal fields.

A remarkable fact is known of some coniferous trees, which has not yet been observed on other trees: that is the ability of the stumps to make new annual circles. On an old silver fir stump have been observed 30 such circles; so the stump increased in thickness 30 years—a phenomenon which is not yet satisfactorily explained.

THE WILLOW FAMILY, (*Salicacæ*),—is to botanists one of the most difficult, because the species can be defined only by the flowers and fruits, because the sterile flowers and the fertile are to be found only on different individuals, and the latter stand often very

distant from each other, and because, as Wimmer, a German botanist, has shown, so many proposed species prove to be only hybrids of two other species. Wimmer enumerates not less than 56 hybrids. Persoon (1805) names 115 species, of which to-day scarcely 70 are considered as true species; and although new ones have been discovered since, the total number of known willows will hardly be a larger one than 50 years ago.

Michaux (Flora Americana, 1803,) enumerates only five North American species; Nuttall (Genera of N. Am. Plants, 1818,) admits 20 indigenous; Pursh., (Flora Amer., Sept. 1814,) 37 species, of which 6 are northern, not belonging to the flora of U. S., and 6 introduced from Europe. One (*Salix Houstoniana*,) occurs only in the southern states; the rest, 24 species, within the limits of Gray's Botany of the Northern U. S. But Gray enumerates only 18 indigenous willows. Of these are 4 Alpine and only 14 are spread over the whole country, and occur probably all in Illinois. Lapham's Catalogue (Transactions, Vol. II.) contains only 5, except which I have found around Peoria: *Salix candida*, Willd., *Salix petiolaris*, Sm., *S. cordata*, Muhl., var. *myricoides*, *S. angustata*, Pursh., *S. nigra*, Marsh, *S. pedicellaris*, Pursh., and in a catalogue, kindly communicated to me by Mr. Bebb, I find *S. discolor*, Muhl., *S. rostrata*, Richardson, and *S. lucida*, Muhl., occurring in Winnebago county.

These 14 genuine American willows are generally found in bottom land and on river banks, where the whitish green gracile foliage gives to the landscape a peculiar, but when it predominates, a melancholy character. Like most of the European species, which extend over the whole Siberian territory to the Pacific—(willows have been observed on the banks of Amur river, with many other European trees)—the American willows have a large geographical distribution; at least some of them extend far west. Fremont has found *Salix longifolia*, Willd., and *S. humilis*, Marsh, on the Platte river; Abert the former and *S. angustata* on the Arkansas, and Emory on the Gila, several narrow leafed species.

Considering the inclination of the willows to produce hybrid forms, we must suspect some very approximate species. For instance, *S. candida*, *S. tristis*, *S. humilis*, *S. discolor* and *S. eriocephala*, to be not all true species. By experiments on producing artificial hybrids, as did Wimmer, some light could be thrown on this matter.

The other genus of this family, *Populus* (Poplar and Aspen) has a much smaller number of species. A. Gray names six, growing within the limits of his Botany of N. H. considering *Populus candicans*, Ait. as a variety of *Populus balsamifera*, L. Four of these are contained in Lapham's catalogue, to which I add *P. grandidentata*, Michx., in Peoria county and Winnebago county. The sixth, *P. monilifera*, Ait., is often confounded with *P. argulata*, our cottonwood, and both, perhaps, one and the same species. The latter is most common in the west. James, in Long's Ex-

pedition to the Rocky Mountains, says: "As far as our observation has extended, the poplar, most common in the country of the Mississippi, and, indeed, almost the only one which occurs, is the angulata. This tree is perhaps as widely distributed as any indigenous to North America, extending at least from Canada to Louisiana, and from the Atlantic to the lower part of Columbia river." Nuttall (Travels to Arkansas Territory) distinguishes two kinds of cottonwood, *Populus angulata*, which he calls sometimes *P. angulisans*, the yellow poplar, with the wood yellowish, and *populus monilifera*, the white poplar "never so large as the preceding, commonly growing in groves like the willows and presenting a bark, which is white and even." Lieut. G. W. Abert, in his report, names *Populus monilifera* and *Populus canadensis*, which are synonyms in Gray's Botany. Fremont mentions *P. monilifera*, Geyer (London Journal of Botany) *P. canadensis*. All use the vernacular name of "cottonwood." The catalogues of trees from different localities in Illinois enumerate either *P. monilifera*, or *P. angulata*—never both of them. The description of both presents so little difference that I think the same could result from local causes and different age of the collected specimens. It will be remarked that I am rather suspicious in many cases; but to believe will not do in scientific matters; doubt is the father, scrutiny the mother of truth. If I had the means to travel, I would follow the tracks of all the above reporters and judge by autopsy. So I can only see what occasion throws in my way, and I must doubt what I know only by imperfect descriptions. To show how patient printing paper is, I will give an example of printed absurdity. A gentleman, describing the landscape in Missouri, mentions the cottonwood, and thinks it necessary to give in parenthesis the botanical name—*Bombax*! This belongs to a quite different family, occurring only in the hottest regions of South America, but as the vernacular name of this tree is "silk cottonwood" the writer did not hesitate to transplant it to a country which he is about to describe and perhaps never has seen.

The cottonwood likes bottom lands exposed to annual inundations, and, on higher situations, such places where rain water stagnates.

P. balsamifera and *tremuloides* extend far north on the Mackenzie river, to 69 deg. N. L. Fremont has found the latter in the Wind-river mountains and the *P. angustifolia* Torr., on the Sweet-water river.

THE BIRCH FAMILY (*Betulaceæ*).—The birch and alder constitute this small family of trees, which habitate chiefly the northern and highest mountain regions. The dwarf or Alpine birch (*Betula nana* L.) extends to 70 deg. N. L. The canoe birch (*B. papyracea*, Ait.) to 69 deg. N. L.; the low birch (*B. pumila*, L.) and two species of alder (*Alnus incana*, Willd.,) and *Alnus viridis*, De C., to 68 deg. N. L., on the Mackenzie river. In Illinois I have seen the red birch (*Betula nigra*, L.) in St. Clair county, on the banks of

the Kaskaskia river, but never around Peoria. The white birch (*Betula alba*, var. *populifolia*, Spach.,) as I learn from Mr. Bebb, grows in Jo Daviess county; the canoe birch, which has the bark externally white, like the last, growing in Wisconsin abundantly everywhere, might be sought for in our northern counties as well as one species of Alder (*Alnus serrulata*, Ait.,) which occurs in Wisconsin and Kentucky, and probably in some places in Illinois. Of all the trees the birch stands the cold climates the best. The white birch extends in Europe to the 71 deg. N. L., and nearly so around the north pole, on both continents. In the warmer zones the birch and alder occur only on the highest mountains; one birch has been detected on the Himmalya, and three species of alder Humboldt met with on the Andes of South America, but not below an elevation of 8,500 feet, and in Mexico in a height of 3,800 feet. The number of known species of both genera is about 36, of which in North America occur 8 birch (with *Betula occidentalis*, Hook, found by Fremont in a great elevation of the Windriver mountains) and three alder.

THE OAK FAMILY (*Cupuliferæ*.)—This contains of the most important of our forest trees, the different species of oak, the beech, the ironwood, the hornbeam, the hazelnut. An American genus, not represented in Illinois, is the Chestnut, and two genera, *Lithocarpus* and *Distegocarpus*; belong to Eastern Asia (Java and Japan.) In Lapham's catalogue of Illinois plants 13 species are enumerated, of which a catalogue of Wisconsin plants contains six, and one more (*Quercus prinus*, L.,) which we do not find in the former. The most common species are the white oak (*Quercus alba*, L.,) the bur oak (*Q. macrocarpa*, Michx.,) the red oak (*Q. rubra*, L.,) and the black oak (*Q. tinctoria*, L.) These grow everywhere in the woods of Illinois. The post oak (*Q. obtusiloba*, Michx.,) I met everywhere in St. Clair county, but never around Peoria. It occurs in Marion country, not in Winnebago county, but Dr. Houghton has found it on the Upper Mississippi, in Wisconsin. Michaux joined the chestnut oaks as five varieties in one species, *Q. prinus*, and I think he was right. A. Gray does the same, at least with three of the proposed species. Different soil and exposure affects the different appearance. The variety *palustris*, (*Q. prinus*, L.,) and *discolor* (*Q. bicolor*, Willd.,) the swamp chestnut oak and the swamp white oak, grow in low alluvial bottoms and swamps—the former more southward, the rock chestnut oak (*Q. prinus monticola*, Michx., *Q. montana*, Willd.,) in rocky places, chiefly in the Alleghanies; the wood is heavier and more valuable than that of both the former. The yellow oak (*Q. prinus acuminata*, Michx., *Q. castanea*, Willd.,) grows on hills, has the leaves narrower and the acorns small. The chinquapin oak (*Q. prinus chinquapin*, Michx., *Q. prinoides*, Willd.,) grows in sandy soil, (not in Illinois,) and is a mere shrub, not over six feet high. The yellow oak is common in Peoria and Tazewell county; it occurs in Cook county

and Winnebago county, but I do not recollect to have seen it in St. Clair county, nor does Mr. Bebb mention it in his catalogue of trees in Marion county. Perhaps it is confined to the northern portion of this State. The swamp white oak is not rare in the bottoms of Peoria lake, in Cook county and St. Clair county, but not reported either from Marion or Winnebago counties. The rock chestnut grows in Marion county. The swamp chestnut oak Mr. Lapham found near Janesville, Wis., which is not far from our northern state line. The laurel oak (*Q. imbricaria*) is common around Peoria, in St. Clair county, Marion county and Menard county, but as it seems not in Cook nor Winnebago counties. So I missed it in Lapham's Wisconsin catalogue, although A. Gray says, "from New Jersey to Wisconsin." The black oak or barren oak (*Q. nigra*, L.) growing in St. Clair, Marion and Menard counties, seems to have its northern limits in Middle Illinois. The pin oak (*Q. palustris*, Du Roi.) I have never seen around Peoria, nor did, as I learn by letter, Mr. Hall in Menard county; it occurs in St. Clair and Marion counties, in Wisconsin and Cook county, (*vide* Mr. Jackson.) The scarlet oak, I must confess, I do not know whether I have seen it or not and whether it exists as a true species at all. Indeed the differences between this and *Q. tinctoria*, Bertl., as far as described, are so unimportant, that I must suspect *Q. tinctoria* var. *angulosa* and var. *sinuosa*, and *Q. coccinea* are varieties of one species. The leaves turning bright scarlet in autumn, which have furnished the specific name, are of no importance in systematical botany. I have seen scarlet and yellowish brown leaves, with deep and with shallow sinuses, on one and the same tree, every fall. *Q. Leana*, Nutt., being a hybrid, I do not think, that except the above, another species of oak occurs in Illinois. The genus *Quercus* is a large one, and continues to increase in number of species by new discoveries, chiefly in the Indian Archipelagus; but at the same time many proposed species have been degraded to the rank of mere varieties of others.

The beech of this continent (*Fagus ferruginea*, Ait.) was formerly supposed to be a mere variety of the European *Fagus silvestris*, L., but it seems to be a proper American species, which forms large forests between the St. Lawrence and the Atlantic, extending southward along the Alleghanies to Georgia, westward to Wisconsin and northwest to Lake Huron and Lake Winnepeg, 50 deg. N. L. Mr. Lapham names it in his catalogue of Illinois plants, but I have never seen it in this State, nor did I find it in any of the catalogues which have been communicated to me from different localities. Dr. Roe, of Bloomington, told me he had seen the beech among the wood piled up at the railroad station, and he had no doubt it could be found within twenty miles of Bloomington. It would be very interesting to know how far west this tree took possession of the soil.* Dr. Engleman, of St. Louis, informs me

* Mr. Ulfers has seen the Beech in the northern part of Union county.—(Editor.)

that the beech crosses the Mississippi along the highlands, near Cape Girardeau. The beech, as I have shown in a paper written for the convention of naturalists at Bloomington, and published in Emery's Journal of Agriculture, is much inclined to migrations, and takes possession of entire countries where it did not exist before—for instance, Denmark. Well, we will not live to see the actual progress of this migration, but the botanists of future times will be grateful for notices collected now on such facts in botanical geography.

The hornbeam, or the blue beech or water beech (*Carpinus Americana*, Michx.), is indiscriminately with the hop-hornbeam (*Ostrya Virginica*, Willd.) called ironwood. Both occur in the woods throughout the State; the latter northward to 50 deg. N. L. Very common too is the wild hazelnut (*Corylus Americana*, Walt.) In Wisconsin grows another species, the beaked hazelnut (*Corylus rostrata*, Ait.) which, perhaps, could be found in our northern counties. Both extend north to 54 deg. N. L.

THE WALNUT FAMILY, (Juglandaceæ.)—It contains two American genera, *Juglans* (the walnuts,) and *Carya* (the hickories;) the former, with two North American species; the black walnut (*Juglans nigra*, L.) and the butternut (*J. cinerea*, L.) both growing everywhere in Illinois and in the United States, east of the Mississippi. The latter has nine North American species, of which two, the water bitternut hickory (*Carya aquatica*, Nutt.) and the nutmeg hickory (*Carya myristicæformis*, Nutt.) occur only in the northern states. Northward extend the walnuts and hickories—not beyond Lake Superior. In Illinois we find the shell-bark hickory (*Carya alba*, Nutt.) and the butternut (*Carya amara*, Nutt.) throughout the State. The pignut, or brown hickory (*Carya glabra*, Torr.) I have not seen around Peoria, but it is named amongst the trees of Menard county and Winnebago county. The mockernut (*Carya tomentosa*, Nutt.) in Peoria county, Menard county and Marion county. The pecan nut (*Carya olivæformis*, Nutt.) an exclusively western species, in Tazewell county, Menard county and St. Clair county. The thick shell-bark hickory extends according to A. Gray, from Pennsylvania to Illinois, but I did not observe it myself, nor do I find it in any catalogue. Only two, the *Carya alba* and *C. glabra*, pass our northern State line into Wisconsin. Of both genera, Leibman has, several years ago, published one species, which he discovered in Mexico, *Carya tetraptera*, Liebm., and *Juglans pyriformis*, Liebm. A new genus, from China, named Lindley *Fortunæa chinensis*.

THE PLANE-TREE FAMILY, (Platanaceæ.)—This is one of the smallest in number of species, not in size of the trees. It consists only of the genus *Platanus*, with a few species, of which only *Pl. occidentalis*, L., grows in North America, from 47 deg. N. L. to the Gulf, and from the Atlantic to the Plains; a second American species (*Pl. Mexicanus*, Moric.) in Mexico and California. Our tree

has different vernacular names: Buttonwood, water beech, plane-tree; in Canada cotton-tree, in the western states generally sycamore. It is found on the river banks everywhere.

THE NETTLE FAMILY, (Urticacæ).—This family comprises several sub-families, of which two contain trees growing in Illinois. The bread-fruit family (Artocarpeæ,) with one species of the *Morus*, the red mulberry, (*Morus rubra*, L.,) growing wild in Illinois everywhere. Two European species, the white and black mulberry, are sometimes cultivated. Mr. Lapham does not name the red mulberry in his Wisconsin catalogue, and marks it in his Illinois catalogue with S., but it grows in Menard county, and abundantly around Peoria; it occurs in Grundy county and sparingly in Winnebago county. Just as well it might be found in the southern part of Wisconsin.

OF THE ELM FAMILY, (Ulmacæ).—we have certainly three species: the white elm (*Ulmus Americana*, L.,) the slippery elm (*Ulmus fulva*, Michx.,) and the hackberry or nettle tree (*Celtis occidentalis*, L.,) *Celtis crassifolia*, Lam., is only a variety of the latter. All throughout the State, the hackberry extending to Lake Superior, the white elm to 54 deg. N. L. The corky white elm (*Ulmus racemosa*, Thom.,) growing from the eastern States to Michigan, may, perhaps, extend to Northern Illinois, and so possibly to Southern Illinois, two southern species growing in Kentucky, the winged elm or wha-hoo (*Ulmus alata*, Michx.,) and the planer-tree (*Plainera aquatica*, Gm.)

THYMELÆACEÆ.—The leatherwood, or moosewood, in New England called Wicopy (*Dirca palustris*, L.,) a low shrub, omitted in Lapham's catalogue, has been found by Mr. Bebb, in Winnebago county.

THE LAUREL FAMILY, (Lauracæ).—*Sassafras officinalis*, Nees., as far as I can find it in the local catalogues, grows northward to Grundy county; the spice bush (*Benzoin odoriferum*, Nees.,) to Menard county; but as both occur in Canada, although not in Wisconsin, it is not improbable that both can be found more northward. The sassafras around Peoria attain a considerable size

THE OLIVE FAMILY, (Olivacæ).—The ash, belonging to this family, is represented in Illinois by 5 species: the white ash (*Fraxinus Americana*, C.,) everywhere in the wooded bottoms and extending north 54 deg. N. L., the red ash (*Fraxinus pubescens*), around Peoria, in the Illinois river bottom, in St. Clair county, and Menard county northward, extending to the Rainy river, 49 deg. N. L. The green ash (*F. viridis*, Michx.,) occurs, according to A. Gray, in Illinois, but I have not yet seen it, nor is it indicated in any catalogue. The black or water ash, (*F. sambucifolia*, Lam.,) grows in Grundy county, Cook county and Winnebago county, but probably throughout the State, as it is in Kentucky.

The blue ash (*F. quadrangulata*, Michx.) around Peoria, in Menard county and Grundy county. On the banks of the Ohio, in South Illinois, there is a shrub which seems not to find a resting place in any family. *Torestiera ligustrina*, Poir., in Gray's botany is placed in the olive family, the same place it occupies in Lapham's catalogue, in which, at the same time, we find it, under another name, (*Borya ligustrina*, Willd.) amongst the Artocarpeæ. Jussieu put it to the Euphorbiaceæ, and, except the above names, it had a third one. In Michaux's Flora, the genus is called *Adelia*. Nuttall (in Gen. of N. Am. Pl.) enumerates 4 species, all growing in the southern States. Perhaps we have two species in South Illinois, or Nuttall, in his Trav. into the Ark. Terr., has mistaken *F. ligustrina* for *F. acuminata*, Poir. He says: "Where (at Shawneetown) we remained for the night, having our boat tied to a stout branch or stem of the *Borya acuminata*, which grows here in abundance, and is nearly as thorny as a sloe bush, sending many straight stems from the same root." The differences between both species are not great; the leaves of the former are entire and nearly sessile; those of the latter minutely serrulate and petioled. Botanists do not agree in another point: the time of flowering. In Gray's Manual April is indicated; in Pursh's Flora Americ., July and August. *Torestiera ligustrina* is common on the Cahokia creek, St. Clair county.

THE BIGNONIA FAMILY (Bignoniaceæ).—This is a tropical, chiefly South American family, which has only a few representatives in the northern temperate zone. *Bignonia capreolata*, L., according to A. Gray, grows in Illinois, probably the most southern part. *Tecoma radicans*, Juss., the beautiful Trompet-creeper, is common around Peoria, and occurs, probably, farther north, but not, as it seems, in Wisconsin. A third species is *Catalpa bignonioides*, Walt., a beautiful ornamental tree, which is often cultivated, but of a doubtful native home. Nuttall says, in his Genera: "Rarely to be met with, decidedly indigenous to the U. S., and appears to have been introduced by the aborigines; hence the name 'Catawba,' derived from a tribe of Indians residing on the Catawba river. In most of the habitats of this tree, given by Michaux, which I have visited, if existing at all, it had evidently been introduced. I am informed, however, by Governor Harrison, of the indubitable existence of this tree, in very considerable quantities, in the forests of the Wabash, Illinois Territory, where its wood is even split for rails. Still, even here it is extremely local, and I have never once met with it, either on the banks of the Ohio, the Mississippi or the Missouri rivers, which I have ascended and descended thousands of miles."

A couple of years afterwards Nuttall saw it below New Madrid, Mo., "in the forests, apparently indigenous, for the first time in my life, though still contiguous to habitations." (Trav. into Ark. Terr., page 47.) Edwin James, (in Long's Exped., I., 33,) nearly the same time Nuttall descended the Ohio for Arkansas, found,

between the mouth of the Cumberland and Tennessee river, the catalpa, here called petalfra, but near a deserted settlement.

Can anybody, living in Southeast Illinois, render account concerning the above considerable quantity "of catalpas split for rails?"

THE SAPODILLA FAMILY, (Sapotaceæ.)—One species grows in South Illinois, *Bumelia lanuginosa*, Persh., in St. Clair county.

THE EBONY FAMILY, (Ebenaceæ.)—The Persimmon, (*Diospyros Virginiana*, L.,) certainly as far north as Cass county.

THE HORAX FAMILY, (Hyracaceæ.)—It is not sure that this family is represented in Illinois, but the snowdrop or silverbell tree (*Halesia tetraptera*, L.,) has been found near Evansville, on the Ohio, and might be sought for in the south part of this State.

THE HOLLY FAMILY, (Aquifoliaceæ.)—Two species belonging to one genus of this family are certainly in Illinois. The black alder (*Ilex verticillata*, A. Gr.,) I have seen in St. Clair county, and *Ilex decidua*, Walt., I received from Dr. Welsch, of the same county. The mountain holly, (*Nemopanthes canadensis*, Raf.,) perhaps, can be found in the northern counties.

THE HEATH FAMILY, (Ericaceæ.)—The cranberries being woody plants, although only very low shrubs, we cannot omit. Two contains Lapham's Catalogue, the black huckleberry (*Gaylussacia resinosa*, Torr. and Gr.,) and the blue huckleberry (*Vaccinium Pennsylvanicum*, Lam.,) probably only in the northern counties, where occurs, perhaps, a third species, being a Wisconsin plant, the common American cranberry (*Vaccinium macrocarpon*, Ait.)

THE MADDER FAMILY, (Rubiaceæ.)—Amongst 14 species growing in Illinois, only one is a woody plant, the everywhere common button-bush (*Cephalanthus occidentalis*, L.)

THE HONEYSUCKLE FAMILY, (Caprifoliaceæ.)—There are seven North American genera, of which each, except *Linnæa*, has representatives in Illinois. The sheepberry (*Viburnum Lentago*, L.) and the common elder, (*Sambucus canadensis*, L.,) throughout the State; the Cranberry tree, (*Viburnum opulus*, L.,) in the northern; *Viburnum obovatum*, Walt., in the southern counties; the black haw, (*Viburnum prunifolium*, L.,) at least as far north as Peoria; the Indian Currant or Coral-berry (*Symphoricarpus vulgaris*, Michx.,) and the Snow-berry (*Symph. racemosus*, Michx.,) I have seen, in St. Clair county—not around Peoria, the small honeysuckle (*Lonicera parviflora*, Lam.,) at least as far north as Peoria; the yellow honeysuckle, (*Lonicera flava*, Tims.,) in Winnebago county. The bush honeysuckle (*Diervilla trifida*, Moench,) I have not seen, but is enumerated in Lapham's Catalogue, and occurs probably in the northern counties, as may do seven other Wisconsin plants of this family: (*Symphoricarpus occidentalis*, R. Br.; *Lonicera ciliata*, Muhl.; *Lonicera coerulea*, L.; *Lonicera oblongifo-*

lia, Muhl.; *Sambucus pubens*, Michx.; *Viburnum dentatum*, L., and *Viburnum acerifolium*, Lam.

THE DOGWOOD FAMILY, (Cornaceæ.)—The Flowering Dogwood (*Cornus florida*, L.) occurs in St. Clair county and Marion county. I have never seen it around Peoria, nor is it amongst Lapham's Wisconsin plants, but, as the general northern limit of this tree, as well as of *Cornus sericea*, L., and *Cornus circinata*, L'Her., is 47 deg. N. L.; it may be found on single localities throughout the State. *Cornus sericea*, L., I find in a catalogue of plants, in St. Clair county, I received from Dr. Welsch, in Mascoutah. The panicked cornel (*Cornus paniculata*, L'Her.) and the Red Osier Dogwood, (*Cornus stolonifera*, Michx.) throughout the State, the latter extending to 69 deg. N. L. *Cornus asperifolia*, Michx., Gray indicates in Illinois, perhaps in the southern part; and so may be found in the northern part, the Wisconsin species, *Cornus alternifolia*, L., and *Cornus circinata*, L'Her. The Tupelo or Sour Gum tree (*Nyssa multiflora*, Wang.) grows in St. Clair county, but how far north I could not ascertain.

THE WITCHHAZEL FAMILY, (Hamamelaceæ.)—The Sweet Gum tree (*Liquidambar styraciflua*, L.) I find in Lapham's Catalogue, but in none of those I have from different parts of Illinois. Another species, of the same family, the Witchhazel (*Hamamelis Virginica*, L.) Mr. Bebb has seen in Ogle county.

THE SAXIFRAGE FAMILY, (Saxifragaceæ.)—There is one shrubby plant in this family, *Hydrangea arborescens*, L., not rare around Peoria and in St. Clair county, and probably everywhere in Illinois.

THE CURRANT FAMILY, (Grossulaceæ.)—The smooth White Gooseberry (*Ribes rotundifolium*, Michx.) and the wild Black Currant, (*Ribes floridum*, L.) are both common shrubs everywhere. That the Swamp Gooseberry, (*Ribes lacustre*, Poir.) occurs in Grundy county I learn from Mr. R. K. Slosson. *Ribes cynosbati*, L., *Ribes hirtellum*, Michx., and the Red Currant (*Ribes rubrum*, L.) are to be sought for.

THE ROSE FAMILY, (Rosaceæ.)—There is a large number of species we have to put in consideration. Roses we have four in St. Clair county: *Rosa setigera*, Michx., *Rosa blanda*, Ait., *Rosa Carolina*, L., and *Rosa lucida*, Ehrh. The two first around Peoria not rare, and the second in Winnebago county. The Black Raspberry (*Rubus occidentalis*, L.) and the common Blackberry (*Rubus villosus*, Ait.) we find everywhere, and so, perhaps, *Rubus strigosus*, Michx., *Rubus Canadensis*, L. and *Rubus hispidus*, L. *Rubus trivialis*, Michx., I have seen in St. Clair county, and *Rubus triflorus*, Rich., occurs perhaps in the northern counties. The common Meadow Sweet (*Spiraea salicifolia*, L.) I found in St. Clair county, and Mr. Bebb, in Winnebago county, where also occurs *Spiraea opulifolia*, L. Hawthorns we have three: *Crataegus crus galli*, L.

Cratægus coccinea, L., and *Cratægus tomentosa*, L., with its varieties everywhere. The Juneberry, (*Amelanchier Canadensis*, Torr. and Gr.) the Crab Apple, (*Pyrus coronaria*, L.) the wild Plum, (*Prunus Americana*, L.) the wild Black Cherry, (*Cerasus serotina*, DeC.) the Choke Cherry (*Cerasus Virginiana*, De C.) are common. The wild Red Cherry (*Cerasus Pennsylvanica*, L.) and the Chickasaw Plum (*Prunus Chicasa*, Michx.) I have not seen, but the latter is reported from Grundy county—whether indigenous or naturalized, that is the question—and the former from Cook county and Winnebago county. The Chokeberry (*Pyrus arbutifolia*, L.) grows in Wisconsin and probably in our northern counties. The American Mountain Ash (*Pyrus Americana*, De C.) I got from the Mackinaw bottom, 10 miles south of Pekin, Tazewell county, where it, I was assured, grows wild.

The northern extension of the several species is as follows: *Cratægus coccinea*, L., *Rubus Canadensis*, *hispidus* and *villosus*, *Rosa setigera*, to 47 deg. N. L.; *Spiræa opulifolia* and *tomentosa* to 50 deg. N. L.; *Prunus Americana*, *Cerasus Pennsylvanica*, *Rubrus strigosus*, *occidentalis* and *Pyrus arbutifolia* to 54 deg. N. L.; *Pyrus Americana* to 60 deg. N. L.; *Cerasus serotina*, *Spiræa salicifolia*, to 62 deg. N. L.; *Cerasus Virginiana* and *Amelanchier Canadensis*, to 67 deg. N. L.; *Rosa blanda*, to 69 deg. N. L.

We perceive the trees and shrubs of the Rose family have mostly a far northern extension. Not so those of another.

THE PULSE FAMILY, (Leguminosæ).—The trees of this family habitate generally the tropic zone, and only a few occur in our climate. Only two we find in the Wisconsin Catalogue: the Honey Locust (*Gleditschia triacanthos*, L.) and the false Indigo, (*Amorpha fruticosa*, L.) northward to Lake Winnipeg. Two extend to 46 deg. N. L., in Canada: the Red Bud (*Cercis Canadensis*, L.) and the Coffee-bean tree, (*Gymnocladus Canadensis*, L.) these four probably everywhere in Illinois. The Water Locust (*Gleditschia monosperma*, Walt.) has Nuttall seen near Fort Massac, on the Ohio. *Wistaria frutescens*, DeC., in South Illinois, (*vide*, Michaux.) It is rather difficult to determine the original geographical distribution of the Locust tree, (*Robinia pseudacacia*, L.) because this tree is cultivated and naturalized on so many places; but the centre of its original home is probably Kentucky, and we can presume that it is a native of South Illinois too; northward, it extends in cultivation, to 47 deg. N. L. *Robinia pseudacacia* is certainly in a wild state as far north as Randolph county, Ill.; *vide* Engelman.

THE MAPLE FAMILY, (Aceraceæ).—Consisting of two genera, (*Acer* with 52 species and *Negundo* with 3 species,) is confined within the northern temperate zone. The former numbers 25 Asiatic, 13 European, 10 North American species and 4 species the native home of which is not ascertained. Two species of *Negundo* are American—one grows in Japan. In Illinois are found the Sugar Maple, (*Acer saccharinum*, Wang.) the White Maple,

(*Acer dasycarpum*, Ehrh.,) the Red or Swamp Maple, (*Acer rubrum*, L.,) and the Box Elder (*Negundo aceroides*, Mœnch.) The latter extends to 54 deg. N. L.; *Acer rubrum* to 53 deg. N., L. in the Rocky Mountains; eastward only to 50 deg. N. L., on Lake Winnipeg, which is the northern boundary of *Acer saccharinum*, *Acer spicatum*, Lam., and *Acer Pennsylvanicum*, L. The two latter are said to grow in Wisconsin, and so, perhaps, in North Illinois. The White Maple extends only to 46 deg. N. L., and is rare north of 43 deg. Six species are natives of the Rocky Mountains, Oregon and California; four other proposed species I did not include in the above number, because they are doubtful.

SAPINDACEÆ.—To this family belong the Buckeyes, of which Lapham's Catalogue contains two; but I have never seen, in Illinois, another species than *Æsculus glabra*, Willd., which is common everywhere in the southern and middle portions of Illinois.

THE BLATTERNUT FAMILY, (Staphyleaceæ.)—The Blatternut (*Staphylea trifolia*, L.) is not rare throughout the State, and extends northward to the south shore of Lake Superior.

THE STAFFTREE FAMILY (Celastraceæ.)—The Bittersweet or Waxwork (*Celastrus scandens*, L.,) and the Spindle tree (*Euonymus atropurpureus*, Lacq.,) are common, and extend to Lake Superior. Another species of the latter genus (*Euonymus Americanus*, L.,) I did not yet meet with.

THE BUCKTHORN FAMILY, (Rhamnaceæ.)—There are two indigenous Buckthorn in Gray's Manual, of which one (*Rhamnus lanceolatus*, Pursh.,) is not rare around Peoria, in Menard county and St. Clair county, the other (*Rhamnus alnifolius*, L'Her.,) is said to occur in Wisconsin, and so, perhaps, in North Illinois, but it extends chiefly northward to 58 deg. N. L. The New Jersey Tea (*Ceanothus Americanus*, L.,) grows from Lake Superior southward, and is, in Illinois, very common; but another species (*Ceanothus ovalis*, Big.,) I find only in the catalogue of Winnebago county, with the mark "rare."

THE VINE FAMILY, (Vitaceæ.)—There are two genera in North America: *Ampelopsis*, with one species, (*A. quinquefolia*, Michx.,) which is common in Illinois, and extends to 50 deg. N. L., and *Vitis*, with eight species. *Vitis bipinnata*, Torr. and Gr., *Vitis incisa*, Nutt., *Vitis vulpina*, L., and *Vitis rupestris*, Scheele, in the southern States, the latter in Texas. *Vitis indivisa*, Willd., a southern species, too, I have collected in St. Clair county. *Vitis riparia*, Michx., is only a variety of *Vitis cordifolia*, Michx., which, with *Vitis æstivalis*, Michx., occurs in Illinois, probably, everywhere. *Vitis Labrusca*, L., I have not seen in a wild state.

THE CASHEW FAMILY, (Anacardiaceæ.)—I find 5 species of Sumach enumerated in Lapham's Catalogue, of which I have met with only three. *Rhus glabra*, L., *Rhus toxicodendron*, L., both

common, and *Rhus aromatica*, Ait., which I have seen in St. Clair county and around Peoria. These three extend northward to 54 deg. N. L. *Rhus copallina*, L., grows in Ogle county, and is, according to Dr. Engleman, very common in Southern Illinois, and *Rhus typhina*, L., is said to grow in St. Clair county, where to have seen it I do not recollect. *Rhus venenata*, De C., is distributed from Canada to Louisiana, so it may be found within the limits of our Flora.

THE RUE FAMILY, (Rutaceæ.)—The Prickly Ash (*Zanthoxylum Americanum*, Mill.) and the Shrubby trifol or Hop tree (*Ptelea trifoliata*, L.) are not rare in thickets, and occur northward to 46 deg. N. L.

THE LINDEN FAMILY, (Tiliaceæ.) The Basswood, (*Tilia Americana*, L.) is common, and occurs to the Lake Winnipeg, 50 deg. N. L. Three other species, *Tilia heterophylla*, Vent., "on the banks of Ohio and Mississippi," (Pursh,) *Tilia alba*, Michx., "in the western States," (Michx. fil.) and *Tilia pubescens*, Ait., "in Kentucky," (Short,) are to be sought for. Perhaps one or the other can be found in Illinois.

THE CUSTARD-APPLE FAMILY, (Anonaceæ.)—Of this family is generally tropical and only one occurs in Illinois: the Papaw, (*Asimina triloba*, Dun.) very common around Peoria, but rarely fruit-bearing. The most northern locality I could ascertain is Grundy county.

THE MAGNOLIA FAMILY, (Magnoliaceæ.)—The North American *Magnolias* habitat, generally, the Alleghanies, but one occurs in the most southern portion of Illinois: the Umbrella tree, (*Magnolia Umbrella*, Lam.) and one species of another genus, the Tulip tree, (*Liriodendron tulipifera*, L.) wrongly called Poplar. It would be interesting to find out their northern and western limits.

In the above account I have named nearly two hundred woody plants, which, for the larger part, certainly grow in Illinois, and of which the rest is expected to be found yet. Of these woody plants are large trees about 40, middle sized trees about 25, small trees 30, shrubs 80 to 85 and twining or creeping woody plants 10. I mentioned often the trees and shrubs which occur in the bordering States to indicate the probability the same could be found in this State. The northern extension of many species taken from the report of Richardson, and the southern extension of others will show that some species which do not grow spontaneously in Illinois, could grow there if transplanted. Sometimes I have given the total number of species and genera of a family to show the proportion of the American and Illinoisan species. Other episodes I made occasionally to interrupt the monotonous enumeration and to give the reader a chance to make interesting observations.

