

**NOTES ON THE NATIVE TREES OF THE LOWER WABASH AND
WHITE RIVER VALLEYS, IN ILLINOIS AND INDIANA.**

By ROBERT RIDGWAY.

[The accompanying notes on the forest-growth of the Lower Wabash Valley were prepared originally for the use of Professor Sargent in his report upon the forest trees of North America for the Tenth Census. It being impossible, however, for him to utilize more than occasional extracts, he suggested to the writer their publication "in toto in some convenient form," so that all interested in this important subject might have the benefit of these observations. It is, therefore, in deference to Professor Sargent's advice that the present paper is herewith presented.]

INTRODUCTION.

Although the field of this paper ostensibly includes the valley of the Wabash and that of its main tributary, White River, from the mouth of the former stream north to where the Ohio and Mississippi Railroad crosses them both (or from latitude $37^{\circ} 50'$ to $38^{\circ} 50'$, approximately), it is proper to state that actual investigations have been made at very few points within the district named, and chiefly in the immediate vicinity of Mount Carmel, Wabash County, Illinois, which alone has been carefully explored. In the limited area comprised within five miles' radius from Mount Carmel, 86 species of trees have been found growing wild, including several which are commonly classed as shrubs, but which there grow to a height of 30 feet or more. Rather protracted observations in Knox County, Indiana, some twenty-five miles to the northeast of Mount Carmel, and in Posey County, 20 miles or more southward, did not increase the list, but extremely desultory observations, made by Dr. J. Schneck, of Mount Carmel, in Gallatin County, Illinois, near the mouth of the Wabash River, where the country is very broken, resulted in the addition of *Juniperus virginiana*, *Chamaecyparis sphaeroidea*, and a *Pinus*;* while White County, the next one south of Wabash, adds one more (*Aralia spinosa*). *Robinia pseudacacia* occurs plentifully in the hilly districts in the southern part of both Illinois and Indiana, but has not been met with in the wild state by the writer.

Halesia tetraptera is quoted from Evansville, Ind. (only forty miles south of Mount Carmel), and from "Southern Illinois"; while the Prince Maximilian von Wied, who passed one winter (October 19, 1832, to March 16, 1833) at New Harmony, Posey County, gives, in his *Reise in das innere Nord-America*,† vol. i, p. 209, a list of about 60 species of trees which came under his observation in that vicinity, and among which are included several which have not been found by Dr. Schneck or myself, though it should be stated that our observations in Posey County have been confined to a very limited field. These species are, "*Juglans*"

* It is as yet undetermined whether the species is *P. mitis* or *P. inops*.

† Published in Coblenz, 1839.

[= *Carya aquatica*, "J." [= *C.*] *myristicaformis*, *Acer* "striatum" [= *A. pennsylvanicum*], *Robinia pseudacacia*, "Cerasus" [= *Prunus virginianus*, and *Nyssa sylvatica*. It is, therefore, very likely that several species are to be added to those given in the appended list, thus making an actual total of nearly 100 species of trees which are native to the valley of the lower Wabash.

The most marked features of the woods in the region under consideration, as compared with those of more eastern districts, are, (1) the entire absence of coniferous trees, except in special and usually very restricted localities, and (2) the great variety of species growing together. They are emphatically "mixed woods," it being very rare indeed to find a single species predominating over all others, though in limited sections or particular localities one or another of the oaks (most frequently *Q. alba*), the Sugar Maple or Sweet Gum, may largely prevail; indeed, even the Honey Locust and Catalpa have been noticed, in a single instance each, to form the prevailing growth on a restricted area. Usually, however, from 40 to 50 species of trees are mixed together indiscriminately upon an area approximating, say, 50 to 75 acres, the relative abundance of the component species varying with the location, character of soil, geological formation, and other local causes. The two following lists, made on the spot, are given as typical:

(1) *Area, about 50 acres; situation, about 1½ miles west of Mount Carmel, Wabash County, Illinois, in bottoms of Greathouse Creek; date, September 16, 1876.*

1. Pawpaw, *Asimina triloba*.
2. Silver Maple, *Acer dasycarpum*.
3. Red Maple, *Acer rubrum*.
4. Sugar Maple, *Acer saccharinum*.
5. Honey Locust, *Gleditsia triacanthos*.
6. Coffee-bean, *Gymnocladus canadensis*.
7. Red-bud, *Cercis canadensis*.
8. Wild Plum, *Prunus virginiana*.
9. Wild Cherry, *Prunus serotina*.
10. Crab Apple, *Pirus coronaria*.
11. Cock-spur Thorn, *Crataegus crus-galli*.
12. "Red Haw", *Crataegus* (species undetermined).
13. Sweet Gum, *Liquidambar styraciflua*.
14. Flowering Dogwood, *Cornus florida*.
15. "Black Gum", *Nyssa (sylvatica?)*.
16. Persimmon, *Diospyros virginiana*.
17. White Ash, *Fraxinus americana*.
18. Blue Ash, *Fraxinus quadrangulata*.
19. Red Ash, *Fraxinus pubescens*.
20. Sassafras, *Sassafras officinale*.
21. White Elm, *Ulmus americana*.

22. Slippery Elm, *Ulmus fulva*.
23. Hackberry, *Celtis occidentalis*.
24. Mulberry, *Morus rubra*.
25. Sycamore, *Platanus occidentalis*.
26. Black Walnut, *Juglans nigra*.
27. Butternut, *Juglans cinerea*.
28. Shell-bark Hickory, *Carya alba*.
29. "Big Shellbark", *Carya sulcata*.
30. "Little Shellbark", *Carya microcarpa*.
31. Black Hickory, *Carya tomentosa*.
32. Broom Hickory, *Carya amara*.
33. Pig-nut Hickory, *Carya porcina*.
34. White Oak, *Quercus alba*.
35. Swamp White Oak, *Quercus bicolor*.
36. "Chinquapin" Oak, *Quercus muhlenbergi*.
37. Michaux's Oak, *Quercus michauxi*.
38. Scarlet Oak, *Quercus coccinea*.
39. Laurel Oak, *Quercus imbricaria*.
40. Water Oak, *Quercus palustris*.
41. Red Oak, *Quercus rubra*.
42. Black Oak, *Quercus tinctoria*.
43. Red Birch, *Betula nigra*.
44. Shining Willow, *Salix lucida*.
45. Cottonwood, *Populus monilifera*.
46. Swamp Cottonwood, *Populus heterophylla*.

The following additional species grew within half a mile of the woods in question, some of them just beyond its borders:

1. Tulip Poplar, *Liriodendron tulipifera*.
2. Box Elder, *Negundo aceroides*.
3. Stag-horn Sumac, *Rhus typhina*.
4. Black Haw, *Viburnum prunifolium*.
5. Winged Elm, *Ulmus alata*.
6. Pecan, *Carya olivæformis*.
7. Spanish Oak, *Quercus falcata*.
8. Black-jack Oak, *Quercus nigra*.
9. Post Oak, *Quercus stellata*.
10. Hornbeam, *Carpinus caroliniana*.
11. Black Willow, *Salix nigra*.
12. Aspen, *Populus tremuloides*?

Making a total of 58 species of trees, all "hard woods," actually found growing on an area of less than one mile square. In addition to these there would be added in certain portions of the river bottoms the following, so that it is possible to find as many as 75 species on the same area in the vicinity of Mount Carmel:

1. Linden, *Tilia americana*.

2. Large-leaved Linden, *Tilia heterophylla*.
3. Buckeye, *Æsculus glabra?*
4. Water Locust, *Gleditschia monosperma*.
5. Narrow-leaved Crab Apple, *Pirus angustifolia*.
6. Scarlet-fruited Thorn, *Cratægus coccinea*.
7. "Red Haw," *Cratægus subvillosa*.
8. Service Tree, *Amelanchier canadensis*.
9. Green Ash, *Fraxinus viridis*.
10. Black Ash, *Fraxinus sambucifolia*.
11. Catalpa, *Catalpa speciosa*.
12. Mississippi Hackberry, *Celtis mississippiensis*.
13. Overcup Oak, *Quercus lyrata*.
14. Hop Hornbeam, *Ostrya virginica*.
15. Beech, *Fagus ferruginea*.
16. Black Birch, *Betula lenta*.
17. Bald Cypress, *Taxodium distichum*.

The larger number of the species in the last list are, of course, more or less local, but it is believed that every one of them, and also those of the two preceding lists (excepting, perhaps, *Ulmus alata*, *Quercus falcata*, *Q. nigra*, and *Q. stellata*, which prefer poorer soils), could be found on an area of less than a square mile in extent, commencing at the bank of the Wabash River, immediately above the mouth of White River, and extending back through the cypress swamp to the bluffs which border the bottom lands. This gives for one square mile of woods, a grand total of more than 70 species of trees, not including several of the larger shrubs (as *Amorpha fruticosa* and *Ilex verticillata*), which here attain almost the stature of trees.

(2) *Area, about 75 acres; location, about 2 miles west of Wheatland, Knox County, Indiana, adjoining the western border of Monteur's Pond; date, May, 1881.*

1. Tulip Poplar, *Liriodendron tulipifera*.
2. Pawpaw, *Asimina triloba*.
3. Silver Maple, *Acer dasycarpum*.
4. Red Maple, *Acer rubrum*.
5. Sugar Maple, *Acer saccharinum*.
6. Box Elder, *Negundo aceroides*.
7. "Dwarf" Sumac, *Rhus copallina*.
8. Smooth Sumac, *Rhus glabra*.
9. Honey Locust, *Gleditschia triacanthos*.
10. Coffee-bean, *Gymnocladus canadensis*.
11. Red-bud, *Cercis canadensis*.
12. Wild Plum, *Prunus americana*.
13. Wild Cherry, *Prunus serotina*.
14. Crab Apple, *Pirus coronaria*.
15. Black Thorn, *Cratægus tomentosa*.

16. "Haw," *Crataegus* (species undetermined.)
17. Sweet Gum, *Liquidambar styraciflua*.
18. Flowering Dogwood, *Cornus florida*.
19. "Black Gum," *Nyssa sylvatica* ?
20. Black Haw, *Viburnum prunifolium*.
21. Persimmon, *Diospyros virginiana*.
22. White Ash, *Fraxinus americana*.
23. Black Ash, *Fraxinus sambucifolia*.
24. Red Ash, *Fraxinus pubescens*.
25. Catalpa, *Catalpa speciosa*.
26. Sassafras, *Sassafras officinale*.
27. White Elm, *Ulmus americana*.
28. Slippery Elm, *Ulmus fulva*.
29. Hackberry, *Celtis occidentalis*..
30. Mulberry, *Morus rubra*.
31. Sycamore, *Platanus occidentalis*.
32. Black Walnut, *Juglans nigra*.
33. Shell-bark Hickory, *Carya alba*.
34. Big Shellbark, *Carya sulcata*.
35. Black Hickory, *Carya tomentosa*.
36. Pig-nut Hickory, *Carya porcina*.
37. Broom Hickory, *Carya amara*.
38. White Oak, *Quercus alba*.
39. Swamp White Oak, *Quercus bicolor*.
40. Bur Oak, *Quercus macrocarpa*.
41. Scarlet Oak, *Quercus coccinea*.
42. Laurel Oak, *Quercus imbricaria*.
43. Water Oak, *Quercus palustris*.
44. Red Oak, *Quercus rubra*.
45. Black Oak, *Quercus tinctoria*.
46. Beech, *Fagus ferruginea*.
47. Hornbeam, *Carpinus caroliniana*.
48. Black Willow, *Salix nigra*.
49. Shining Willow, *Salix lucida*.
50. Swamp Cottonwood, *Populus heterophylla*.
51. Common Cottonwood, *Populus monilifera*.
52. Aspen, *Populus tremuloides*.

Originally, much the larger part of the district under consideration was heavily timbered, and at present the nearest actual prairies to Mount Carmel are distant about 20 to 30 miles in Lawrence and Richmond Counties, Illinois. Since the first settlement of the country,* however, the distribution of the timber has very materially changed, much of the original forest having been cleared for cultivation, while on the other hand nearly all the smaller prairies have become trans-

* Mount Carmel was laid out as a town in 1818, but the surrounding country had already become sparsely settled.

formed into woodland. It is difficult to now estimate what proportion of the original growth (considered as to area, little if any being now in its primitive condition) is now standing, but it is stated by those most competent to judge, that on account of this encroachment of the woods upon the former prairies, there is now a greater extent of woodland in Wabash and adjoining counties (in Illinois) than there was fifty years ago. The growth of this new forest is so rapid that extensive woods near Mount Carmel (consisting chiefly of Oaks and Hickories, averaging more than 80 feet high, and 1 to nearly 2 feet in diameter), were open prairie within the memory of some of the present owners of the land!

The original growth of the richer bottom lands and slopes of the bluffs was probably equal in magnitude to that of any other hard-wood forest in Eastern North America; at least the taller trees even now standing considerably exceed in height the dimensions given in standard textbooks, and evidently based on the growth of other sections of the country. That this discrepancy of size indicates actual superiority I am, however, loth to believe, but am rather inclined to attribute it to a paucity of measurements of trees in other sections, a view of the case which is considerably strengthened by the fact that the diameter of the larger trees does not greatly exceed that attained in the original forest along the Atlantic seaboard, except, perhaps, in the case of particular species. Certain it is, that the virgin forests of the western slope of the Alleghanies, in West Virginia, and, possibly, that of some portions of Southern Ohio, appear to compare very favorably with those of the lower Wabash region; at least that is the impression which I have received from passing through them repeatedly by rail; while I am confident that in Jackson County, Indiana, near the line of the Ohio and Mississippi Railroad even a larger growth exists at the present time than in most parts of the Lower Wabash Valley, but I have no measurements wherewith to substantiate this impression.

The investigations upon which my knowledge of the timber of the Lower Wabash region is based extend over many years, during which time an opportunity for taking a desirable measurement was never neglected. I have furthermore received much assistance from friends and correspondents interested in the subject, among whom I may especially mention Dr. J. Schneck, of Mount Carmel; his brother, Charles Schneck, of Posey County, Indiana; and Mr. Thos. J. Johnston, county surveyor of Posey County. Dr. Schneck has already published, in Professor Cox's *Geological Survey of Indiana* (volume for 1875, pp. 504-579), a "Catalogue of the Flora of the Wabash Valley, below the mouth of White River," in which may be found most important information respecting the subject in hand; and in reply to letters asking for measurements of the timber of their localities, both of the other gentlemen named above responded with the desired information. The measurements taken by Messrs. Johnston and Schneck are herewith given.

(1.) *Measurements of trees in New Harmony Township, Posey County, Indiana, by Thos. J. Johnston, county surveyor.*

Name of tree.	Circumference at 3 feet from ground.	Distance to first large limb.	Total height.	Remarks.
	<i>Ft. In.</i>	<i>Fect.</i>	<i>Fect.</i>	
Yellow Poplar. (<i>Liriodendron tulipifera</i>)	21	80	145	Hollow base.*
Do.	19	60	130	Sound.
White Poplar. (<i>Liriodendron tulipifera</i>)	16	70	125	Do.
Do.	15° 6'	50	110	Do.
Yellow Poplar. (<i>Liriodendron tulipifera</i>)	14° 9'	55	120	Do.
White Oak. (<i>Quercus alba</i>)	15	60	115	Do.
Do.	15° 4'	54	110	Do.
Do.	13° 6'	45	97	Do.
Do.	13° 4'	48	107	Partially hollow.
Do.	13	43	95	Sound.
Do.	12° 5'	35	87	Do.
Black Oak. (<i>Quercus tinctoria</i> ?)	18	75	128	Do.
Do.	17° 6'	60	118	Do.
Do.	20	50	102	"Swell but."
Do.	14	49	100	Sound.
Do.	12° 6'	43	96	Do.
Bar Oak. (<i>Quercus macrocarpa</i>)	18° 3'	35	75	Do.
Do.	17° 2'	37	80	Do.
Do.	14° 7'	31	77	Do.
Do.	12° 9'	32	76	Do.
Sweet Gum. (<i>Liquidambar styraciflua</i>)	13° 6'	70	115	Hollow
Do.	12	60	100	Sound.
Do.	11° 8'	62	104	Do.
Do.	11° 2'	58	98	Do.
Mulberry. (<i>Morus rubra</i>)	10	20	60	Do.
Sassafras. (<i>Sassafras officinale</i>)	7° 6'	75	95	Do.
Sugar-tree. (<i>Acer saccharinum</i>)	12	48	90	Do.
Maple. (<i>Acer rubrum</i> ?)	11° 7'	70	108	Do.

* This tree and the next growing near together.

(2.) *Measurements of trees in vicinity of Big Creek, Posey County, Indiana, by Mr. Charles Schneck.*

Name of tree.	Circumference in feet, 3 feet from ground.	Distance to first large limb.	Total height.	Remarks.
Cotton. (<i>Populus monilifera</i>)	18	70	165	Bottoms; sound.
Ash. (<i>Fraxinus americana</i> ?)	13	65	137	Hills; sound.
Oak. (<i>Quercus alba</i> ?)	14	.....	.....	Hills.
Poplar. (<i>Liriodendron tulipifera</i>)	15	78	140	Hills; sound.
Do.	17½	81	142	Do.
Do.	20	91	155	Do.
Do.	19½	.....	.....	Hill.
Cotton. (<i>Populus monilifera</i>)	19	74	135	Bottoms; sound.
Walnut. (<i>Juglans nigra</i>)	17½	60	130	Bottoms; a small hollow.
Bar Oak. (<i>Quercus macrocarpa</i>)	21	.....	.....	Bottoms; sound.
Sycamore. (<i>Platanus occidentalis</i>)	22	.....	.....	Do.
Bar Oak. (<i>Quercus macrocarpa</i>)	18	60	130	Do.
Gum. (<i>Liquidambar styraciflua</i>)	17	.....	.....	Bottoms.
Sycamore. (<i>Platanus occidentalis</i>)	24	.....	.....	Bottoms; sound.
Lin. (<i>Tilia americana</i>)	17	.....	.....	Bottoms.

The following extracts from Mr. Johnston's letter accompanying the measurements sent by him may also be of interest:

"The decayed stump of a poplar [*i. e.*, Tulip Tree] is now partly stand-

ing near here (New Harmony) that is said by good citizens to have been, when standing, about 37 feet in circumference. . . . There are some Cottonwoods here that I have not mentioned [in the list], some 5 to 6 feet diameter. Some large Sycamores, 'swell-butts,' reach even 37 to 40 feet circumference, but they are hollow."

The heaviest timber in Posey County is said to be in Point Township, in the lower end of the county.

In Dr. Schneck's "Catalogue of the Flora of the Lower Wabash Valley," already referred to, the author gives (on p. 512) a table of measurements, which are said to show the maximum size attained by 23 species of trees, "the measurements in each case being those of one individual."

Name.	Circumference 3 ft. from ground, or above roots and swell.	Height of trunk from root to first branch.	Total height.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
Pecan (<i>Carya oliviformis</i>)	16	90	175
Black Oak (<i>Quercus coccinea</i> var. <i>tinctoria</i>)	20	75	160
Bur Oak (<i>Quercus macrocarpa</i>)	22	72	165
White Oak (<i>Quercus alba</i>)	18	60	150
Persimmon (<i>Diospyros virginiana</i>)	5½	80	115
Black Walnut (<i>Juglans nigra</i>)	2½	74	155
Honey Locust (<i>Gleditsia triacanthos</i>)	18	61	129
Catalpa (<i>Catalpa bignonioides</i>). [= <i>C. speciosa</i> ?]	6	48	101
Mulberry (<i>Morus rubra</i>)	10½	20	62
Scarlet Oak (<i>Quercus coccinea</i>)	20½	94	181
Sassafras (<i>Sassafras officinale</i>)	7¾	75	95
Bass-wood (<i>Tilia americana</i>)	17½	59	109
Bald Cypress (<i>Taxodium distichum</i>)	18¾	74	146
Red Maple (<i>Acer rubrum</i>)	13	60	108
Sycamore (<i>Platanus occidentalis</i>)	33½	68	176
Tulip Tree (<i>Liriodendron tulipifera</i>)	25	91	190
White Ash (<i>Fraxinus americana</i>)	17½	90	144
Cottonwood (<i>Populus monilifera</i>)	22	75	170
Sweet Gum (<i>Liquidambar styraciflua</i>)	17	80	164
Black Hickory (<i>Carya tomentosa</i>)	10½	55	112
Sugar Maple (<i>Acer saccharinum</i>)	12½	60	118
Water Oak (<i>Quercus palustris</i>)	12	23	120
Beech (<i>Fagus ferruginea</i>)	11	10	122

It may be remarked that the size indicated by the above figures is, in the case of some species, highly exceptional, and that I have measured none so large. Not that a single one of the three measurements given is so very unusual (though this is in some cases true as regards height), but that it is exceedingly uncommon to find such extreme measurements of girth, length of trunk, and total height combined in a single tree.

According to measurements thus far made it has been determined beyond doubt that at least thirty-four species of trees reach or exceed a height of 100 feet, and it is all but certain that some ten or a dozen more, of which no measurements have been taken, also reach this height. No less than eleven reach, occasionally, at least, a height of 150 feet, the greatest height of any tree, so far as determined by accurate measurements, being 190 feet (*Liriodendron*); two (*Liriodendron* and *Quercus coccinea*, *vide* Dr. Schneck) reach a height of 180 feet; four reach 170 feet;

eight attain 160 feet; eleven grow 150 feet high; thirteen 140; sixteen reach 130; twenty-three reach 120 feet; twenty-seven 115 feet; twenty-nine grow to 110 feet; and thirty-two exceed 105 feet.

The following list of the species determined as growing to 100 feet elevation or more shows the maximum height according to the independent measurements of Dr. Schneck, Mr. Charles Schneck, Mr. Thomas J. Johnston, and myself:

List of trees attaining a height of 100 feet or more in the Lower Wabash Valley.

No.	Name.	Maximum height.
1	<i>Liriodendron tulipifera</i>	+150, R. R.; 155, C. S.; 145, T. J. J.; 190, Dr. S.
2	<i>Tilia americana</i>	130, R. R.; 109, Dr. S.
3	<i>Acer dasycarpum</i>	118, R. R.
4	<i>Acer rubrum</i>	108, R. R., Dr. S., T. J. J.
5	<i>Acer saccharinum</i>	115, R. R.; 118, Dr. S.; 90, T. J. J.
6	<i>Gymnocladus canadensis</i>	109, R. R.
7	<i>Gleditsia triacanthos</i>	137, R. R.; 129, Dr. S.
8	<i>Liquidambar styraciflua</i>	144, R. R.; 115, T. J. J.; 164, Dr. S.
9	<i>Nyssa (sylvatica ?)</i>	125, R. R.
10	<i>Diospyros virginiana</i>	115, Dr. S.
11	<i>Fraxinus americana</i>	144, R. R., Dr. S.; 137, C. S.
12	<i>Fraxinus quadrangulata</i>	124, R. R.
13	<i>Catalpa speciosa</i>	101, Dr. S.
14	<i>Ulmus americana</i>	119, R. R.
15	<i>Celtis occidentalis</i>	134, R. R.
16	<i>Platanus occidentalis</i>	168, R. R., Dr. S.
17	<i>Juglans cinerea</i>	117, R. R.
18	<i>Juglans nigra</i>	156, R. R.; 155, Dr. S.; 130, C. S.
19	<i>Carya alba</i>	129, R. R.
20	<i>Carya amara</i>	113, R. R.
21	<i>Carya olivæformis</i>	175, Dr. S.
22	<i>Carya tomentosa</i>	+107, R. R.; 112, Dr. S.
23	<i>Quercus alba</i>	142, R. R.; 150, Dr. S.; 115, T. J. J.
24	<i>Quercus bicolor</i>	+100, R. R.
25	<i>Quercus coccinea</i>	181, Dr. Schneck.
26	<i>Quercus imbricaria</i>	100, R. R.
27	<i>Quercus macrocarpa</i>	162, R. R.; 165, Dr. S.; 130, C. S.; 80, T. J. J.
28	<i>Quercus muhlenbergi</i>	122 ¹ , R. R.
29	<i>Quercus palustris</i>	119, R. R.; 120, Dr. S.
30	<i>Quercus rubra</i>	150, R. R.
31	<i>Quercus tinctoria</i>	128, T. J. J.; 160, Dr. S.; +100, R. R.
32	<i>Fagus ferruginea</i>	122, Dr. S.
33	<i>Populus monilifera</i>	140, R. R.; 165, C. S.; 170, Dr. S.
34	<i>Taxodium distichum</i>	147, R. R.; 146, Dr. S.

In addition to the above there are several other trees large specimens of which have not been measured, but which, with scarce a doubt, occasionally, at least, reach 100 feet in height, thus rendering it very probable that in reality about fifty species attain this elevation. These species are the following:

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|------------------------------------|---|
| * 1. <i>Magnolia acuminata.</i> | 10. <i>Carya sulcata.</i> |
| 2. <i>Tilia heterophylla.</i> | 11. <i>Quercus michauxi.</i> |
| * 3. <i>Robinia pseudacacia.</i> | 12. <i>Quercus falcata.</i> |
| 4. <i>Prunus serotina.</i> | 13. <i>Quercus lyrata.</i> |
| 5. <i>Fraxinus pubescens.</i> | 14. <i>Quercus stellata.</i> |
| 6. <i>Fraxinus sambucifolia.</i> | * 15. <i>Castanea vulgaris americana.</i> |
| 7. <i>Fraxinus viridis.</i> | * 16. <i>Chamæcypharis sphæroidea.</i> |
| 8. <i>Celtis mississippiensis.</i> | * 17. <i>Pinus (mitis?).</i> |
| 9. <i>Carya porcina.</i> | |

* These trees, though growing within the field of this paper, have not been met with by the writer.

The measurements given under the head of the species enumerated in the following list include all the reliable ones which I have made up to date, or which I have been able to get upon unimpeachable authority, and, it should be understood, cancel all measurements or estimates previously published by me *when in excess of those here given*. They include no estimates of height, but only actual tape-line measurements of prostrate trees or else very careful measurements of isolated standing trees with a thoroughly-tested "dendrometer," although the specimens measured by the latter method are very few indeed.

The following species, usually classed as shrubs, are not included, though some of them may occasionally reach 30 feet in height. No measurements, however, have been taken of any of them :

1. *Xanthoxylum americanum*. Prickly Ash.
2. *Ptelea trifoliata*. Hop Tree; Wafer Ash.
3. *Euonymus atropurpureus*. Burning Bush; Waahoo.
4. *Hydrangea arborescens*. Wild Hydrangea.
5. *Hamamelis virginica*. Witch Hazel.
6. *Ilex decidua*. Deciduous Holly.
7. *Forestiera acuminata*. Forestiera.
8. *Lindera benzoin*. Spice Bush.
9. *Alnus serrulata*. Smooth Alder.
10. *Aralia spinosa*. Hercules' Club; "Devil's walking-stick."

On the other hand, a small number which are not usually classed as trees are so considered here, having been found to attain, occasionally, at least, a height of 30 feet or more. They are the following :

No.	Name.	Maximum height as measured.
1	<i>Ilex verticillata</i>	28 feet, but taller ones seen.
2	<i>Rhus glabra</i>	30 feet.
3	<i>Rhus copallina</i>	33½ feet.
4	<i>Amorpha fruticosa</i>	35 feet.

SMITHSONIAN INSTITUTION, July 20, 1881.

CATALOGUE.

1. (1.) * *Magnolia acuminata*. Cucumber Tree.

I have never seen a tree of this species growing in any part of the district under consideration. I have *heard*, however, that a few grow on Sugar Creek, in the southern part of Wabash County, but have been unable to verify the rumor. It grows quite abundantly in the extreme southern portion of Illinois (Johnson and Union Counties), where the

* The number in parenthesis prefixed to the name of a species corresponds in each case with that given in Professor Sargent's *Catalogue of the Forest Trees of North America*, published by the Census Bureau (Washington, 1881). When no second number is given, the species is one not included in the catalogue in question.

country is very hilly, and therefore adapted to it. The nearest point in Indiana where I can find a record of its occurrence is Orange County, the third county east from Knox.

2. (8.) *Liriodendron tulipifera*. Tulip Tree; "Poplar."

Formerly very abundant, and still common in some localities. The great demand for poplar lumber for weatherboarding, etc., has greatly depleted the supply, however. Although growing both on the hills and in the river bottoms, the growth of the former will probably average larger than the latter. The larger trees of this species now standing will average about 5 feet diameter and 140 feet high, though specimens of much larger size may still be found, and formerly were numerous. A few yet exist, having a diameter of 7 or even 8 feet, but they are exceedingly rare. Straight trunks of 50 to 70 feet clear are occasionally found, and twenty years ago trunks 100 feet long were not so very unfrequent.

Lumbermen recognize three varieties of the "poplar"—the "yellow," "white," and "blue," distinguished, however, only by the color of the wood. The first is the most abundant, and produces the best lumber.

This species flowers during the first half of May, leafing the first half of April.

*List of specimens measured.**

Specimen.	Girth above swell at base.	Distance from ground to first large limb.	Total height.	Locality.	Authority.
a	15	78	140	Hills, Posey County, Indiana	Charles Schneck.
b	17½	81	142	do	Do.
c	20	91	155	do	Do.
d	19½			do	Do.
e	21	80	145	Posey County, Indiana	Thos. J. Johnston. ("Yellow.")
f	19	60	130	do	Do.
g	16	70	125	do	Thos. J. Johnston. ("White.")
h	15½	50	110	do	Do.
i	14½	55	120	do	Thos. J. Johnston. ("Yellow.")
j	37			do	Thos. J. Johnston. (Stump.)
k	12		143	Wabash County, Illinois	Dr. J. Schneck.
l	20	70	153	do	Do.
m	23½	50	139	do	Do.
n	20	60	168	do	Do.
o	19½	82	145	do	Do.
p	12	88	120	do	Do.
q	23	74	158	do	Do.
r	19½	61	142	do	Do.
s	19	70	140	do	Do.
t	23	72	158	do	Do.
u		120		do	Do.
v	20	100		do	R. Ridgway.
w	19	58		do	Do.
x	17	70		do	Do.
y	19	64		do	Do.
z	+ 26	+ 50		do	Do.
a'	15½		145	Knox County, Indiana	Do.
b'	15½	47	145½	do	Do.
c'	14	84		Wabash County, Illinois	Thos. Hoskinson.
d'	23	62	158	do	Dr. J. Schneck.
e'	22			do	R. Ridgway.

* The measurements are in feet.

With the exception of the last two, the trees of the above list were all felled, and the total length measured with a 100-foot tape-line. The two exceptions were fine, vigorous, standing trees, and their height measured with a "dendrometer." Standing isolated, this was easily done, and the measurements are no doubt perfectly accurate.

The finest tree of all those given above was example *q*, which at 74 feet measured 6 feet in diameter, the trunk being perfectly sound even at the extreme base, and straight as a column.

The longest trunk (example *u*) was cut into ten 12-foot logs. It was not very large, however, measuring, if I remember rightly, about 4 feet in diameter at the butt and less than three feet through at the top of the last cut. A trunk measuring 84 feet in length (sawed into seven 12-foot logs), measured 54 inches in diameter at the butt and 42 inches at the small end of the last cut. This is the tree marked *c'* in the list.

At the "Timber Settlement" in Wabash County, I measured, in May, 1881, a solid stump of this tree, which, although entirely denuded of bark and with a considerable portion hewn off for firewood, was still 26 feet in circumference at 4 feet from the ground. A portion of the trunk still lying on the ground was 50 feet or more in length, and had apparently supplied the occupants of a deserted cabin near by with firewood for many years.

The example marked *v* was 35 feet in circumference at the ground, and at 150 feet from the base the several branches were 1 to 1½ feet in diameter. The top branches, broken off and scattered by the falling of the tree, had been collected for firewood, so that its total height could not be measured, but could not have been much less than 190 feet, which is the maximum height as given by Dr. Schneek in his "Flora of the Wabash Valley" (Cox's *Geological Survey of Indiana*, 1875, p. 512).

3. (10.) *Asimina triloba*. Pawpaw.

The Pawpaw is a very abundant underwood in all bottom lands and other damp woods, growing usually to a height of 20 to 30 feet, and 2 or 3 inches in diameter, but not unfrequently 40 feet or more in height, and, in exceptional cases, nearly a foot in diameter. The two largest specimens measured (both in the bottoms below Mount Carmel) were 46 and 43 feet, respectively, in height, the larger being 32 inches in circumference, the smaller only 10 inches around.

Two well-marked varieties are distinguished by the fruit, which in one has the pulp a rich golden yellow, very aromatic, and exceedingly sweet, and much liked by most people, though too rich for many. This variety is known as the "Yellow Pawpaw"; the other, called "White Pawpaw," has a whitish or very faintly yellow, insipid, or disagreeable tasting fruit, and is seldom eaten. I am unable to state whether any peculiarity of flower or foliage distinguishes the two varieties.

4. (14.) *Tilia americana*. American Linden. "Lin."

A very common tree, growing chiefly near the river banks, but occurring in all rich woods. The average height of the larger trees is about 100 feet, but an elevation of 125 or even 130 feet is sometimes reached, the diameter of large trees averaging about 3 feet. In the Wabash bottoms single trunks of the "Lin" are exceedingly rare, fully 80 per cent. of the trees consisting of compound trunks, as if several trees had grown up close together and become more or less completely coalesced at the base.

The following measurements are of trees of rather exceptional size :

Specimen.	Girth above swell at base.	Distance from ground to first large limb.	Total height.	Locality.	Authority.
<i>a</i>	8	53	110	Wabash County, Illinois.....	R. R. (Hills.)
<i>b</i>	22½	.....	.....	Gibson County, Indiana.....	R. R. (Bottoms.)
<i>c</i>	17	.....	.....	Wabash County, Illinois.....	Do.
<i>d</i>	.....	.....	130	.....do.....	Do.
<i>e</i>	17½	40	.....	.....do.....	Do.
<i>f</i>	13	.....	125	.....do.....	Do.
<i>g</i>	.....	62	.....	.....do.....	Do.
<i>h</i>	17½	50	109	.....do.....	Dr. J. Schneck.

Example *b* was the largest I have seen, but was divided into three trunks a short distance from the ground.

5. (15.) *Tilia heterophylla*. White Basswood.

This tree has been found near Mount Carmel by Dr. Schneck, but I am not autoptically acquainted with it. Possibly some of the measurements given under the head of *T. americana* belong to this species.

6. (—.) *Ilex verticillata*. Black Alder.

Very abundant about the borders of ponds and swamps, and the mouths of the creeks, forming dense almost impenetrable thickets. In some localities it grows to a height of 20 feet and upwards, with a stem 2 to nearly 3 feet in circumference. The two largest measured were 2 feet 11 inches, and 2½ feet, respectively, in girth, and the tallest (cut down especially for measurement) 28 feet high. Taller specimens, which were apparently about 35 feet high, were seen in the Cypress swamp, in the lower part of Knox County, Indiana.

7. (40?) *Aesculus glabra*? Smooth Buckeye?

Although I give the species as *A. glabra*, on the strength of Dr. Schneck's identification, I am not sure but that we have the *A. flava* also. The specimens examined by me (a considerable number, in the bottoms nearly opposite the village of Rochester, Wabash County),

were 70 or 80 feet high, and some of them 2 feet or more in diameter, thus appearing too large for *Æ. glabra*. Whichever it may be, however, the Buckeye is a very local tree in the Wabash Valley, and I have only seen it in the locality mentioned, where it appears to be confined wholly to a belt of only a few hundred yards width, a few trees only being found on the opposite side of the river. I am unable to ascribe any reason for this restriction of its range, since the same trees, and other vegetation associated with it, occur throughout the bottoms on either side. It is said to be common among the hills of Gibson County, several miles back from the river, and there to attain a height of 100 feet or more, and a diameter of 3 feet.

8. (47.) *Acer dasycarpum*. Silver Maple.

A very abundant tree along the banks of rivers and large streams, attaining an average elevation of 90 to 100 feet, and a diameter of 2 to 3 feet. Unlike the Red Maple (*A. rubrum*) the trunk usually divides low down, usually at about 8 to 15 feet from the ground; the three or more secondary trunks, however, extending upward for a considerable distance before branching.

Of four trees measured, the extremes were: height, 90 and 118 feet; circumference, $12\frac{1}{2}$ to 14 feet; trunk, 20 feet (only one measured).

Flowers early in April, leafing from March 31 to April 12.

9. (51.) *Acer rubrum*. Red Maple.

A very common tree, but much more local than *A. dasycarpum*. Is almost wholly confined to swamps or very wet bottoms, where it grows tall, straight, and slender. In size it is about equal to *A. dasycarpum* and *A. saccharinum*, but is much more slender than either, with a less spreading top. Three specimens measured 70 to 108 feet in height, the average being $95\frac{1}{3}$ feet; $10\frac{1}{2}$ to 15 feet in circumference (average 12.83), clear trunk, 49 to 60 feet. Decidedly taller trees occur, however, those measured being prostrate ones, of by no means the largest size.

Flowers middle of February to March 20, according to the season; leaves out last of March to April 12.—(SCHNECK.)

10. (52.) *Acer saccharinum*. Sugar Maple.

A very abundant tree in some localities, rare or wholly wanting in other portions. Occasional "sugar groves" occur where, over a space of several acres, scarcely a single tree of any other species can be found.

The larger trees of this species average about 100 feet high (the average of the five specimens measured being $108\frac{2}{5}$ feet, the extremes 90 and 118), and $2\frac{1}{2}$ to 3, occasionally over 4, feet in diameter. The trunk, like that of *A. rubrum*, is frequently tall and straight, four specimens measured being, respectively, 47, 48, 60, and 70 feet to the first limb. The var. *nigrum* and the common form appear to be about equally numerous,

each, however, predominating, or even wholly replacing the other, in particular localities.

Flowers as early as March 10 (SCHNECK), leafing April 15 to 20.

11. (53.) *Negundo aceroides*. Box Elder.

A very common, and in some localities abundant, underwood in rich bottoms. The larger trees of this species are $2\frac{1}{2}$ to 3—rarely 4—feet in diameter, and 50 to 60, possibly 70, feet high. No measurements for height have been made, but the tallest specimens do not approach the elevation of the oaks and other trees with which they are associated.

Flowers March 20, leafing the last week in April.

12. (56.) *Rhus typhina*. Stag-horn Sumac.

In most localities less common than *R. glabra*. The largest specimens observed were about 30 to 35 feet high, and 4 inches in diameter.

13. (—.) *Rhus glabra*. Smooth Sumac.

Much the commonest species, and when growing in woods or thickets attaining a height of 30 to 35 feet. Near Monteur's Pond, in Knox County, Indiana, I found this species and *R. copallina* growing together, and to about an equal size.

14. (—.) *Rhus copallina*. "Dwarf Sumac." (!)

A very common species in some localities. Near the northwestern border of Monteur's Pond, in Knox County, Indiana, it is an abundant underwood, growing frequently to a height of 25 to 30 feet, and 4 inches or over in diameter. Three specimens (the only ones measured) were, respectively, $25\frac{1}{2}$, $31\frac{1}{4}$, and $32\frac{1}{2}$ feet in height (all being cut down for measurement), 6, 7, and $1\frac{1}{2}$ feet trunk, and 14, 8, and 29 inches in circumference. The last consisted properly three stems united at the base, though near the ground the coalescence of the wood was almost complete, while externally there was no evidence of the triple nature of the trunk. A section of this trunk, also leaves and fruit of the same tree, has been deposited in the museum of the Agricultural Department.

15. (—.) *Amorpha fruticosa*. False Indigo.

In the cypress swamps of Knox County, Indiana, I found this shrub growing to a very unusual size, many specimens being 20 feet and upwards in height. The largest one seen was cut down for measurement, and found to be 35 feet high; it was 17 inches in circumference at the base, and contained eighteen annual rings.

16. (65.) *Gymnocladus canadensis*. Coffee-bean; Coffee-nut.

Scarcely one of our native trees is more local in its distribution than the present species, and there are few localities indeed where it can be said to be abundant. It is usually found scattered through the richer bottoms.

It is never a large tree, but grows tall and slender, frequently reaching 100 feet in height, though seldom over 2 feet in diameter, and with a rather scant top. One tree, cut expressly for measurement, was 109 feet in length, 76 feet to the first limb, and only 20 inches in diameter across the stump. The largest trunk was that of a tree growing in a door-yard, and possibly a cultivated specimen. It was 8 feet in circumference, but ramified at about 4 feet from the ground into several upright branches. The top was dense and symmetrical, the summit elevated about 80 feet.

17. (66.) *Gleditschia monosperma*. Water Locust.

An abundant species in the cypress swamps in the lower part of Knox County, Indiana, where it grows along with the Large-leaved Cottonwood (*Populus heterophylla*), White Ash (*Fraxinus americana*), Black Willow (*Salix nigra*), and other swamp trees. It is a very much smaller tree than *G. triacanthos* and of quite different appearance, having a smoothish, dull-gray bark (much like that of the Hackberry, *Celtis*), and very crooked, scraggy growth. The largest specimen measured was 7 feet in circumference and 65 feet in height.

18. (67.) *Gleditschia triacanthos*. Honey Locust.

When growing to its full perfection, the Honey Locust is one of the most majestic trees of the forest in which it is native. Many trees occur which are 120 to nearly 140 feet high, with straight trunks of 50 to 70 feet clear, and 4 to 5, occasionally even 6, feet in diameter. There are none of our trees, excepting only the Bald Cypress and Catalpa, which have a more thoroughly characteristic appearance, its tall, straight, but usually inclined trunk of a dark iron-gray or nearly black color being much darker than any other species, and thus easily identified at a considerable distance, while the extremely delicate foliage renders its top equally conspicuous by its contrast with the adjacent tree tops. The Honey Locust usually, like very many other trees, occurs singly throughout the richer woods, but it is occasionally multiplied so as to form the prevailing growth. It was found thus multiplied over an area of a hundred acres or more in the White River bottoms of Gibson County, Indiana, where the trees of this species constituted more than half the forest, and averaged 2 to 3 feet in diameter and 100 feet high, with occasional specimens of considerably larger size.

The finest tree of this species which I have ever seen was an isolated one standing near the roadside in Posey County, Indiana. It was tall and straight, with a widely-spread, symmetrical top, the trunk measuring 18 feet in circumference at a yard from the ground, and about 60 feet to the first limbs. It was apparently sound throughout, and was not less than 120 feet high.

The following measurements are of rather unusually large specimens :

Specimen.	Girth above swell at base.	Distance from ground to first large limb.	Total height.	Locality.	Authority and remarks.
a	17	50	.....	Posey County, Indiana	R. R. About 130 feet high.
b	15	(70?)	.....	Gibson County, Indiana	Do.
c	14	63	137	Wabash County, Illinois	R. R.
d	13	70	130	do	R. R. Ambitus, 50 feet.
e	18	61	129	Posey County, Indiana	Dr. J. Schneck and R. R.

19. (58.) *Robinia pseudacacia*. Black Locust.

Not observed in a native state by Dr. Schneck or myself in Wabash or adjoining counties in Illinois, or in Knox, Gibson, and Posey Counties, Indiana. Given by Maximilian, however, in his list of the trees found in the latter county, where, probably, found only in hilly localities.

20. (70.) *Cercis canadensis*. Red-bud.

A very abundant underwood in all rich woods, but attaining its greatest development in the bottom lands, where specimens 40 to 50 feet high and 1 foot in diameter are not uncommon. The following measurements have been taken :

Specimen.	Girth above swell at base.	Distance from ground to first large limb.	Total height.	Locality.	Authority.
a	3 $\frac{5}{8}$	15	50	.....	Wabash County, Illinois.....
b	5 $\frac{3}{8}$	19	46	41	.....do
c	2 $\frac{3}{8}$	23 $\frac{3}{8}$	54	.....	Knox County, Indiana
d	1 $\frac{1}{2}$	10 $\frac{3}{8}$	41	.....	.....do

Flowers April 10 to 15, leafing from the 15th to the 20th of the same month.

21. (76.) *Prunus americana*. Wild Plum.

22. (78.) *Prunus chicasa*. Chickasaw Plum.

Wild Plums are very abundant, but whether the *P. chicasa* is common in the wild state I do not know. I have seen cultivated trees, however, which were about 20 feet high and nearly a foot in diameter. *P. americana* is usually 15 to 20, sometimes 30 feet high, and flowers April 10.

23. (81.) *Prunus serotina*. "Wild Cherry."

Once very common, the wild cherry is now rare in most portions of the Wabash Valley. It is partial to the hilly country back from the river, and it is there that the trees of this species attain the largest size. They were formerly found 100 or more feet high and 3 to 4 feet in diameter, and a few may perhaps still be found having this stature. I have measured but a single tree of this species, however, the one in question being $7\frac{1}{2}$ feet in girth, 31 feet to the first branch, and 94 feet high, being by no means so large as some that might be found.

Flowers about the middle of April, leafing a little later.

24. (86.) *Pirus angustifolia*. Narrow-leaved Crab Apple.

This species has been found in Wabash County by Dr. J. Schneck (see Cox's *Geological Survey of Indiana*, 1875, p. 528). It is perhaps not so common as *P. coronaria*, but blooms at about the same time. According to Dr. S. it is "usually taller than *P. coronaria*."

25. (87.) *Pirus coronaria*. Crab Apple.

Common in rich woods, sometimes forming extensive thickets. I have made no measurements, but would say that trees 25 to 30 feet high and nearly a foot in diameter are occasionally found; trunks 6 to 8 inches through, being, however, more common. It blooms in April and May, leafing about the middle of the former month.

26. (94.) *Crataegus coccinea*. Scarlet-fruited Thorn.

"Open upland woods; not rare; April, May." (SCHNECK.) No measurements taken.

27. (95.) *Crataegus cordata*. Washington Thorn.

Given in Patterson's catalogue of the plants of Illinois on Dr. Schneck's authority.

28. (96.) *Crataegus crus-galli*. Cockspur Thorn.

"Low moist thickets; common; March to May." (SCHNECK.) No measurements.

29. (101.) *Crataegus subvillosa*. "Red Haw."

River banks chiefly; common; blossoms in April and May. A specimen (cut down) measured 37 feet in height, $2\frac{1}{4}$ feet in circumference.

30. (102.) *Crataegus tomentosa*. Black Thorn.

"Thickets; rare; March, April." (SCHNECK.) No measurements; begins to leaf April 22 to 25. (SCHNECK.)

31. (105.) *Amelanchier canadensis*. June Berry.

Found by Dr. Schneck, but not recognized by the writer, and probably rare.

32. (106.) *Liquidambar styraciflua*. Sweet Gum.

One of the most abundant trees in the river bottoms, where in some places it constitutes the prevailing growth. It is one of the tallest and stateliest of forest trees, frequently attaining an elevation of 130 feet, and occasionally of 150 feet or more, with straight trunks 60 to 80 feet clear and 4 feet in diameter. Only the Tulip Tree (*Liriodendron*) rivals it in altitude of the trunk, but in symmetry cannot be compared to it, except in occasional instances. As frequently seen, it has by far the tallest and straightest shaft of any tree in the forest. One trunk 71 feet long measured only 8 inches less in diameter at the small end than at the lower, where the diameter was a little less than 3 feet. Another trunk 94 feet long was only 11½ feet in girth at the large end. The two largest specimens seen each measured 17 feet in circumference, one of them having a trunk of 80 feet clear. The tallest tree measured was one cut for lumber, and was 164 feet in total length.

Blossoms in May.

Specimen.	Girth above swell at base.	Distance from ground to first large limb.	Total height.	Locality.	Authority.
a	17			Posey County, Indiana	Schneck.
b	13½	70	115	do	Thomas J. Johnston.
c	12	60	100	do	Do.
d	11½	62	104	do	Do.
e	11	58	98	do	Do.
f			144	Wabash County, Illinois	R. R.
g	9½		140	do	Do.
h	7		120	do	Do.
i	13			do	Do.
j		83		do	Do.
k	13	81		do	Do.
l		76		do	Do.
m	12½	78		do	Do.
n	11½	94	137	do	Do.
o	9	71		do	Do.
p	17	80	164	do	Dr. J. Schneck.
q	11	(70 ?)	127	Knox County, Indiana	R. R.
r	10½		128	do	Do.
s	12	(90 ?)	129	do	Do.
t	13		128½	do	Do.

The tree marked *m* was straight as an arrow, and not less than 135 feet high; the top spread 85 feet. No. *o* was 2 feet 2 inches in diameter at the upper end.

33. (114.) *Aralia spinosa*. Angelica Tree; "Devil's Walking Stick."

Not seen in Wabash County, but grows in White, the next county south.

34. (115.) *Cornus florida*. "Dogwood."

A very abundant tree in upland woods. Occasionally reaches 50 feet or more in height, and a foot or more in diameter, but is usually much

smaller. The only trees measured, two of rather exceptional size, were $3\frac{1}{2}$ and $4\frac{1}{8}$ feet in circumference, with trunks 30 feet clear. The total height of the first (a standing tree) was estimated at 60 feet; the latter (prostrate, and measured with tape-line) was 50 feet long.

Blossoms in April or May, and commences to leaf about April 20.

35. (119?) *Nyssa multiflora*? "Black Gum."

A very abundant tree both on uplands and in the bottoms. Grows tall and slender, with few large branches except at the extreme summit, but the trunk frequently thickly set with small horizontal branches to near the ground, thus closely approximating the "excurrent" growth characteristic of many *Coniferae*. Growing on thin or dry soils, its height does not usually much exceed 70 or 80 feet, but on rich lands an elevation of 100 to 120 feet or more is sometimes reached, one specimen being 125 feet long, 13 feet in circumference, and the trunk entirely free from branches for 64 feet. An exceptionally large specimen, which may possibly have been *N. uniflora*, growing in the bottoms of Posey County, Indiana (but not in water), was 18 feet in circumference, and proportionately tall.

It may be that some of our so-called "Black Gums" may be *N. sylvatica*, but of this I am not certain.

Begins to leaf May 1.

36. (123.) *Viburnum lentago*. Sweet Viburnum; Sheep Berry.

"Dry, open wood, scarce." (Dr. SCHNECK.) No measurements.

37. (124.) *Viburnum prunifolium*. Black Haw.

Very abundant on rich lands. Blossoms in April or May. No measurements have been taken, but no specimens exceeding 25 feet in height have been observed.

38. (—.) *Viburnum dentatum*. Arrow-wood.

"I have seen but one tree. May, June." (SCHNECK.)

Begins to leaf the last week in March, and blooms about the 10th of April.

39. (143.) *Diospyros virginiana*. Persimmon.

Common everywhere. When growing in the thick bottom-forest is frequently 100 feet or more in height, the tallest specimen measured being 115 feet high, 80 feet to the first limb, but only $5\frac{1}{2}$ feet in girth at the base, or less than 2 feet in diameter! When growing in open fields or along roadsides (where it is most frequently seen), it forms a more spreading tree, usually 30 to 40, and rarely more than 50, feet high.

40. (148.) *Fraxinus americana*. White Ash.

Very common in the bottom lands, where it becomes one of the very tallest trees, an altitude of 140 feet being not uncommon, while clear trunks of 60 to 90 feet are occasionally met with. When growing in

very wet lands it becomes greatly enlarged at the base, some such trees measuring 30 feet in girth at the ground, but rapidly contracting, so that at 20 feet they diminish one-half to two-thirds in bulk. These "swell-butt ashes" are said to decay first at the top, and to be sometimes solid at the base. Following is a list of measurements of large trees of this species:

Specimen.	Girth above swell at base.	Distance from ground to first large limb.	Total height.	Locality.	Authority.
<i>a</i>	16 $\frac{1}{2}$	.....	.....	Wabash County, Illinois.....	R. R.
<i>b</i>	17 $\frac{1}{2}$	.....	.....	.....do.....	Do.
<i>c</i>	13	83	144	.....do.....	Do.
<i>d</i>	10	90	.....	.....do.....	Do.
<i>e</i>	13	65	137	Posey County, Indiana.....	Charles Schneck.
<i>f</i>	27	.....	.....	Wabash County, Illinois.....	R. R.
<i>g</i>	20	.....	.....	.....do.....	Do.
<i>h</i>	29	.....	.....	.....do.....	Do.
<i>i</i>	17 $\frac{1}{2}$	90	144	.....do.....	Do.
<i>j</i>	15 $\frac{1}{2}$	45 $\frac{1}{2}$	.....	.....do.....	Do.
<i>k</i>	11	50	143	Knox County, Indiana.....	Do.
<i>l</i>	12	47	105	.....do.....	Do.

Tree marked *c* was 9 feet in circumference at the small end of the trunk, which was perfectly solid throughout; *d* was 7½ feet in girth at the small end; *j* was a prostrate tree with the top totally destroyed, but at 100 feet from the base were six branches averaging nearly 1 foot in diameter, so that it could not have been much less than 140 feet long.

41. (154.) *Fraxinus pubescens*. Red Ash.

Rather rare. No measurements.

42. (155.) *Fraxinus sambucifolia*. "Black Ash"; "Hoop Ash."

"Swamps and wet places; not rare." (SCHNECK.) Abundant in the northern portion of Monteur's Pond, Knox County, Indiana, where it grows tall and slender, frequently 80 and occasionally nearly or quite 100 feet high, the only specimen measured being 83 feet long, trunk 57 feet, diameter (at 5 feet from the ground—the base being considerably swollen), 1½ feet. This tree presents so very close a resemblance in bark, foliage, and general aspect to young Pecan trees (*Carya olivæformis*), as to be not readily distinguished, except by experts.

43. (156.) *Fraxinus quadrangulata*. Blue Ash.

Common in rich hilly woods; resembles in general appearance *F. americana*, but is smaller and more slender. Four freshly cut trees, felled on a space including not more than two acres, were 2 to 2½ feet in diameter (across top of stump), 51 to 76 feet clear trunk, and 116 to 124 feet long. A fine tree still standing on the same piece of ground was 13 feet in girth, and at least 50 feet to the first limb.

44. (157.) *Fraxinus viridis*. Green Ash.

Not uncommon in wet woods; no measurements.

45. (165.) *Catalpa speciosa*. Catalpa; "Patalpha"; "Wahoo."

Formerly abundant in rich bottom lands, but now nearly exterminated in many localities. Trees of 100 feet or more in height were formerly not uncommon, while a diameter of $4\frac{1}{2}$ feet has been reported (see Cox's *Geological Survey of Indiana*, 1873, p. 417). The usual dimensions, however, are, for the larger trees, 70 to 90 feet high, and $2\frac{1}{2}$ to 3 feet diameter. It is usually, however, decidedly smaller, and when growing in open situations forms a low spreading tree, seldom more than 50 feet in height, and frequently much less. Trees of this character were formerly very abundant in the bottoms about a mile above Mount Carmel, but they have nearly all been cut for fence-posts.

In Posey County, Indiana, while making inquiries of an intelligent gentleman regarding the timber of his neighborhood, I was informed that the day before he had cut a Catalpa, the trunk of which produced eight 7 foot post-cuts, the diameter at the base being 4 feet, while the total length of the tree he estimated at about 130 feet.

Blossoms late in May or early in June (seen in full bloom near the O. and M. R. R., between Shoals and Huron, Indiana, May 30, 1881.)

Specimen.	Girth above swell at base.	Distance from ground to first large limb.	Total height.	Locality.	Authority.
a	8	.....	90	Wabash County, Illinois.....	R. R.
b	10	60	.....	.....do	R. R.
c	6	48	101	Posey County, Indiana.....	Dr. J. Schneck.

46. (171.) *Sassafras officinale*. Sassafras.

Very common, and in rich woods growing to a large size. The lumber of this tree is more highly prized than any other for skiffs, being light, strong, and durable. It is also much used for fence-posts and rails. Although averaging perhaps not more than 50 feet in height and a foot in diameter it is occasionally much larger, reaching in rare instances a diameter of 4 feet. The largest trees measured by me, however, were much less, being respectively, 7, $7\frac{1}{2}$, and $7\frac{3}{4}$ feet in girth; the last 60 feet high, with a clear trunk of 30 feet; the second 95 feet high, with a trunk 75 feet long.

47. (176.) *Ulmus alata*. Winged Elm.

A rather rare tree, chiefly in river bottoms and along banks of streams; no measurements.

48. (177.) *Ulmus americana*. White Elm; "Red Elm."

A very common tree, most abundant in rich bottoms, where it attains a large size. Trees fully equaling the finest New England specimens are not uncommon, many being 5 feet in diameter and 120 feet or more in height. A very remarkable specimen was seen in the bottoms below Mount Carmel. It had grown in a thick wood, but the surrounding trees having been cleared away, was thus exposed to full view. The trunk, $3\frac{1}{2}$ feet in diameter, extended straight upward like a shaft or column for about 40 feet, and then gradually enlarged, and subdivided, the subdivisions coalescing in places, but finally taking the character of distinct branches, of which about 13 could be counted; these main upright branches gradually diverged, now and then dividing, to near the top, which was gracefully inclined outwards all round, and with an extremely regular outline. This bouquet-shaped top had an ambitus of about 50 feet, while its summit was elevated about 120 feet above the ground. In the immediate vicinity of Mount Carmel are several very beautiful elm trees of the dome-shaped type, one having an ambitus of about 90 feet, the ends of the branches nearly touching the ground, and the total height about 70 or 75 feet. Another one expands 91 feet, though the total height of the tree is scarcely 60 feet, and the diameter of its trunk only a little over 3 feet. It is needless to remark that both these trees are completely isolated. The largest specimen which I have measured was 16 feet in circumference (above the spurs), the trunk undivided for about 50 feet, and the total height more than 120 feet. The ambitus of this tree was 105 feet, but another, also a very large tree, expanded 111 feet.

A conspicuous peculiarity of this tree, when growing in wet situations, consists in the very prominent spurs or buttresses thrown out from the base. These thin walls extend sometimes many feet from the body of the tree, some specimens with a trunk 3 feet or less in diameter above the spurs being 12 to 15 feet in diameter at the ground. The only other tree exhibiting this feature to a marked degree is the Red Oak (*Quercus rubra*), in which, however, the spurs are thicker and do not project so far as they do with the present species in extreme cases.

The White Elm is the tree to which the mistletoe (*Phoradendron flavescens*) is most partial, fully 90 per cent. of the trees affected by this parasite in the White River and Wabash bottoms being elms; in fact, I have never seen it except on this tree and the Honey Locust (*Gleditsia triacanthos*). In the vicinity of Evansville, however, only 40 miles southeast from Mount Carmel, the case is said to be quite different, according to Professor John Collett, who gives a list of thirteen species of trees upon which this parasite was found growing, the Black Gum being first, the "Red Elm" (*i. e.*, *Ulmus americana*) second, and the Honey Locust fifth, in the order of numbers upon which it grows. (See Cox's *Geological Survey of Indiana*, 1875, p. 242.)

The following specimens of *Ulmus americana* have been measured by me :

Specimen.	Girth above swell at base.	Distance from ground to first large limb.	Total height.	Ambitus.	Locality.	Authority.
a	15½	(50?)	.....	85	Wabash County, Illinois.....	R. R.
b	.....	59	.....	.....	do	R. R.
c	16	(55?)	.....	105	do	R. R.
d	10	.....	(60?)	91	do	R. R.
e	11	50	.....	80	do	R. R.
f	15	35	.....	.....	do	R. R.
g	15½	40	.....	85	do	R. R.
h	.....	.....	.....	111	Knox County, Indiana	R. R.
i	10	(50?)	119	50	Wabash County, Illinois.....	R. R.

Flowers March 10 to 20, and begins to leaf the last week in April.

49. (179.) *Ulmus fulva*. "Slippery Elm."

A common tree in rich woods, but much less abundant than *U. americana*. Grows commonly from 50 to 70 feet high, and 1½ to 2 feet in diameter, although much larger specimens undoubtedly occur. No measurements, however, have been taken.

50. (183.) *Celtis mississippiensis*. Mississippi Hackberry.

A very common tree, though less numerous than *C. occidentalis*, with which it is found associated in very rich bottoms. It is usually a smaller tree than that species, commonly 60 to 80 feet high, the branches growing lower down, the bark of the trunk covered with prominent warty excrescences, and the leaves smaller, more coriaceous, and entire. The only specimen measured was 60 feet high and 11 in circumference.

51. (184.) *Celtis occidentalis*. Hackberry.

A very tall and beautiful tree in rich bottoms, growing frequently 120 to 130 feet high and 3 feet in diameter, with a tall, straight trunk of 60 to 70, or even 80, feet to the first limb. When growing to its full perfection in a dense forest, there is an individuality in the aspect of this tree which it is difficult to describe. It does not excel either in height or girth, yet it has the appearance of being one of the very tallest trees in this lofty forest, this illusion being doubtless due to the extreme slenderness and great length of the trunk, which not unfrequently comprises three-fourths of the total height of the tree, the smooth, gray bark conspicuously clouded on the north side, with blackish moss or lichen for the entire length. This striking appearance is sometimes still further increased by vines of the Virginia Creeper ascending to the topmost branches, which are wreathed and matted with its foliage. Although 83 feet is the greatest length of the tape-line actually stretched along a

trunk of this species, one tree was seen whose silvery shaft gleamed among the surrounding tree-tops in a wood where the summit level was considerably more than 100 feet aloft, and though only ten feet in circumference must have been upwards of 90 feet to the first limb, which grew not more than 25 feet from the extreme summit of the tree.

The following tape-line measurements of prostrate specimens have been made in the vicinity of Mount Carmel:

Specimen.	Girth above swell at base.	Distance from ground to first large limb.	Total height.	Locality.	Authority.
a	9	70	.....	Gibson County, Indiana	R. R.
b	10	75	.....	do	Do.
c	13	46	.....	Knox County, Indiana	Do.
d	9	46	.....	Gibson County, Indiana	Do.
e	11	83	134	do	Do.

52. (189.) *Morus rubra*. Mulberry.

Very common on rich lands. The largest specimens measured were the following:

Specimen.	Girth above swell at base.	Distance from ground to first large limb.	Total height.	Locality.	Authority.
a	10	20	60	Posey County, Indiana	Thomas J. Johnston.
b	10 $\frac{1}{2}$	20	62	Wabash County, Illinois (?)	Dr. J. Schneck.
c	4 $\frac{1}{2}$	19 $\frac{1}{2}$	68	do	R. R.

53. (191.) *Platanus occidentalis*. Sycamore.

This very abundant tree is unquestionably the largest hard-wood of North America, though there are several which it does not excel in height. The largest specimens are 140 to 160 feet high, with an ambitus of 100 to 130 feet, the diameter of single trunks averaging 5 to 7 feet, but of compound trunks (*i. e.*, those which fork comparatively near the ground), 8 to 10 feet. The chief superiority of the Sycamore over other trees, in point of size, consists, however, in the massiveness of the branches, each of the principal limbs of a very large tree of this species fully equaling an average forest tree in bulk. Twelve trees measured the same day in the bottoms of Gibson County, Indiana, below the mouth of Patoka Creek, averaged 127 feet spread of top and 23 $\frac{1}{2}$ feet in circumference, the extremes being 100 to 135 and 14 to 30 feet;

two other trees had an ambitus of 108 and 97 feet, respectively, while another was 33 feet in girth. These being all standing trees, their height could not be measured accurately, but not one of them was less than 100 feet high. The average height of eight trees, which are all that have been actually measured, was $145\frac{1}{2}$ feet, the extremes being 129 and 168 feet.

Begins to leaf May 1.

The following detailed list of all the specimens measured may be of interest, as showing the great amount of variation in proportions in this tree:

Specimen.	Girth above swell at base.	Distance to first large limb or fork.	Total height.	Ambitus.	Locality.	Authority.
a	30	7	160	134×112	Gibson County, Indiana.....	R. R. (Photographed.)
b	30	18 (?)	(160 ?)	126	do.....	Do.
c	31	12	145	105	do.....	Do.
d	24		140		do.....	R. R.
e				108	do.....	Do.
f				97	do.....	Do.
g	14			100	do.....	Do.
h	19			100	do.....	Do.
i	$18\frac{1}{2}$			128	do.....	Do.
j	$22\frac{1}{2}$			135	do.....	Do.
k	33				do.....	Do.
l	$28\frac{1}{2}$			129	do.....	Do.
m	$22\frac{1}{2}$			110	do.....	Do.
n	$29\frac{1}{2}$			134	do.....	Do.
o	23			100	do.....	Do.
p	25			130	do.....	Do.
q	27	50			Wabash County, Illinois.....	Do.
r	25	40			do.....	R. R. (Photographed.)
s	30	60			do.....	R. R.
t	25	68	168		do.....	Do.
u	$33\frac{1}{2}$	13			do.....	Do.
v	18	74			do.....	Do.
w	9	$83\frac{1}{2}$			do.....	Do.
x	22		140		do.....	Do.
y	15	61	129		do.....	Do.
z	$14\frac{1}{2}$	63	141		do.....	Do.
a'	13	55	139		do.....	Do.
b'	22				Posey County, Indiana.....	Charles Schneck.
c'	24				do.....	Do.

a. This is probably the largest tree of any kind which I have seen anywhere in the Wabash Valley, or any other part of the Eastern Province of North America. It is of very vigorous growth, and apparently perfectly sound. Circumference at the ground, 42 feet; round smallest part of the trunk, 30 feet; greatest diameter, 15 feet, least diameter, 10 feet, the average diameter being about 11 feet. Ambitus, 134 feet in one direction, the least spread of top being 112 feet. Total height, as determined by several measurements with "dendrometer," and by shadow, about 160 feet. The trunk first divides at about 7 feet from the ground, but above this division the main stem is still 8 feet in diameter; this extends upward, *gradually enlarging*, to about 15 feet from the ground, where the next division takes place, the next fork being nearly 30 feet up. No horizontal branches are thrown out until a height of 70 or 80 feet is reached (or about half the total height of the tree), the

great bulk of the broadly spreading top being elevated above 90 feet from the ground.

b. This tree, though slightly less in diameter and spread of top, is a more symmetrical, and in this respect a decidedly finer tree than the preceding. Although the trunk first ramifies at a distance of about 18 feet from the ground, both forks extend straight upward, the larger straight as a column, and averaging about 6 feet in diameter, for 50 feet, the smaller 70 feet or more (but the upper portion curving gracefully outward). The top constitutes, when in full leaf, a compact dome of foliage, the great bulk of which constitutes the upper third of the total height. The tree is in perfect vigor, without a single dead branch, and showing no signs of decay about the base. Its trunk is wreathed with vines of the Virginia Creeper, which, extending upward for more than 100 feet, show in beautiful contrast to the smooth snow white bark of the larger branches and upper portion of the trunk.

c. Trunk divides at about 10 or 12 feet from the ground, where the circumference is much greater than at the ground.

r. Probably the handsomest trunk of any sycamore which I have ever seen. It rises like a huge column, 8 feet in average diameter, without any perceptible diminution for at least 40 feet, from a widely expanded base, measuring 17 feet in diameter and more than 50 feet in circumference, from which spring four "sprouts," the largest of which is nearly three feet in diameter, and all extending nearly straight upward, to almost the height of the main tree. The base is covered with dark green moss, and the trunk ornamented with the Virginia creeper. The trunk is hollow, and has recently been disfigured on one side by the axe of some vandal.

u. Not a handsome tree, the three main forks widely diverging.

y and *z.* Solid trees, newly felled, growing only 12 feet apart!

a'. 84 feet to second limb.

The decaying prostrate remains were found in the bottoms of Gibson County, Indiana, a short distance below Mount Carmel, of a huge sycamore, which must have been much larger than any tree that I have measured. The space covered by the crumbled base was 66 feet in circumference. The three upright forks, found lying near together, two of them still united, the other broken off, were each 5 feet in diameter, and careful measurements of them indicated a circumference of about 62 feet, below their ramification, which took place some 20 feet from the ground, and the base of the tree. Each of the three trunks, which were still intact, though much decayed exteriorly, was 70 feet long, but the branches were, of course, entirely decayed. When standing in its full vigor, this tree must have been a grand one, indeed. There is said to be still standing, near Worthington, Greene County, Indiana, a tree of this species which has a solid trunk measuring 48 feet in circumference, and dividing at 25 feet into three or four main branches, the largest of which is more than 5 feet in diameter.—(See *Case's Botanical Index*, April, 1880, and *Botanical Gazette*, June, 1880, p. 70.)

54. (195.) *Juglans cinerea*. Butternut; White Walnut.

By no means a common tree, except in certain restricted localities. Though very much inferior to *J. nigra* in stature, it sometimes attains a considerable size, two felled trees, in the "Timber Settlement," Wabash County, measuring 97 and 117 feet in length, and each 1 foot 10 inches in diameter, with clear trunks 50 and 32 feet long. These trees grew within a few rods of one another, the species being very common in that locality.

55. (196.) *Juglans nigra*. Black Walnut; "Walnut."

The Black Walnut was, originally, a very abundant tree throughout the rich bottom lands of the Wabash and White Rivers, but is now rapidly becoming scarce. Trees of this species, 5 or 6 feet in diameter, with straight, solid trunks 40 to 60 feet in the clear, were formerly common, but the finest trees have long been destroyed. Eight walnut trees, of less than medium size, were found freshly felled, in the bottoms of Greathouse Creek, about two miles west of Mount Carmel, and carefully measured, with the following result: Average length, 106½ feet; average length of trunk, 47¼ feet; average circumference, 9½ feet. Extreme measurements: length, 97½ to 119½; trunk, 35½ to 60; circumference, 8 to 10½. In the river bottoms the growth is much larger. One very fine tree measured 5½ feet across the top of the stump, 42½ feet to the first limb, 75 feet to the second limb, and 131 feet to the extreme top. A perfectly sound and very symmetrical standing tree, of which photographs were taken, measured 18 feet in girth at a yard from the ground, had an ambitus of 97 feet, and was little, if any, less than 150 feet high, the trunk alone being over 70 feet to the first limb, on main fork.

The following measurements represent, very fairly, the size of Black Walnut trees which have been cut for lumber in the vicinity of Mount Carmel:

	Girth.	Trunk.	Height.	Ambitus.	Locality.	Authority.
a	15½	40	.....	.....	Wabash County, Illinois.....	R. R.
b	17½	60	.....	.....	Posey County, Indiana.....	Charles Schneck.
c	20	64	.....	.....	Gibson County, Indiana.....	R. R.
d	18½	.....	.....	.....	do.....	R. R. (Photographed.)
e	18	(75?)	(+150?)	97	do.....	Do.
f	15	70	.....	.....	Wabash County, Illinois.....	R. R.
g	15	71	144	.....	do.....	Do.
h	13	94	156	.....	do.....	Do.
i	15	67	144	.....	do.....	Do.
j	17	43½	131	.....	do.....	Do.
k	9	44½	97½	.....	do.....	R. R. (Greathouse Creek.)
l	10½	54½	119½	.....	do.....	Do.
m	8	54	103	.....	do.....	Do.
n	8½	38½	106½	.....	do.....	Do.
o	9½	60	113	.....	do.....	Do.
p	8½	35½	101	.....	do.....	Do.
q	9	45½	107½	.....	do.....	Do.
r	9½	45½	162	.....	do.....	Do.
s	22	74	155	.....	Wabash County, Illinois (?).....	Dr. J. Schneck.

Remarks.—*f*, trunk 3 feet diameter at upper end; *g*, ditto.

56. (198.) *Carya alba*. "Shell-bark."

Very common, attaining its greatest size on rich sand ridges in the bottom-lands, where specimens 3 to 4 feet in diameter and 130 feet or more high are not rare. The maximum height attained by this species has not been ascertained, but it is one of the very tallest trees of the forest, the tough and elastic top branches not being liable to be broken by the wind, as is so often the case with tall "Poplars" and "Sycamores." Some tall shell-barks are certainly 150 feet high, and probably more, many trunks, apparently constituting less than half the total height, being 70 or 80 feet to the first limb. The following measurements may in part refer to *C. sulcata*, it being impossible to distinguish this species from *C. alba*, except by the fruit and foliage, and some of the measurements were taken in winter.

Flowers April 15 to 20, leafing from the 10th to the 13th of the same month.

Specimen.	Girth.	Trunk.	Total height.	Locality.	Authority.
a	11	70	.....	Wabash County, Illinois	R. R.
b	13	(80?)	.....	.....do.....	Do.
c	14 $\frac{3}{4}$	78	.....	.....do.....	Do.
d	11	75	.....	.....do.....	Do.
e	10 $\frac{1}{2}$	51	129	.....do.....	Do.
f	5	39	101	Knox County, Indiana, <i>young tree!</i> ...	Do.
g	4 $\frac{1}{2}$	51	88	.....do.....	Do.

The so-called *C. microcarpa*, which may be a distinct species, is also found. Dr. Schneck, in his catalogue (p. 560), says: "Heavy damp soil, scarce. Has very little loose bark, one of our smallest hickories." One specimen, however, of what was apparently this form, measured 14 feet in girth and was considerably over 100 feet high.

57. (199.) *Carya amara*. Swamp Hickory; White Hickory.

Not uncommon in the bottoms, growing tall and slender, being occasionally 100 feet or more high and 3 feet in diameter. The largest measured was 11 feet in circumference; another was 113 feet high and 6 $\frac{1}{2}$ in circumference, the trunk 64 feet.

58. (—.) *Carya oliviformis*. Pecan (pronounced *Pe-cawn'*).

Common in rich bottom lands. This is by far the largest of the hickories, being, in truth, one of the very largest trees of the forest. With the single exception of the White Elm the Pecan tree has, in proportion to its size, the most widely-expanded head of any tree, while in altitude and majestic appearance the largest and finest elms bear no comparison. The dome-like head may occasionally be seen reared conspicuously above the surrounding tree-tops, even in a very lofty forest, some trees being as much as 175 feet high (by actual measurement) and with an

ambitus of 100 feet or more. The trunk, like that of the shell-bark hickories (*C. alba* and *C. sulcata*), is very long, often measuring more than 50 feet, and occasionally 80 or even 90 feet, to the first limb. A very large tree of this species, cut down in the "Timber Settlement," Wabash County, and measured by Dr. Schneck, was found to be 175 feet high, with a clear trunk 90 feet long and 16 in circumference. Another still standing, only fifteen yards distant, had exactly the same circumference, and apparently agreed very closely in other measurements. A very fine tree in the White River bottoms of Gibson County, Indiana, was 30 feet in circumference at the ground and 18½ feet around above the swollen base; the column-like trunk was more than 50 feet to the first limb, while the lofty top spread 100 feet. Near Sandborn, in Knox County, Indiana, according to Professor Collett (Cox's *Geological Survey of Indiana*, 1873, p. 364), there is a tree of this species measuring 8 feet in diameter, but its height is not stated.

59. (202.) *Carya porcina*. "Pig-nut"; "Broom Hickory."

Common, usually in upland woods. No measurements.

60. (203.) *Carya sulcata*. "Big Shell-bark"; "Bottoms Shell-bark."

A very common tree in rich bottom lands, where, growing to a large size, and in the character of its bark, as well as in general appearance, exactly resembling *C. alba*. For this reason it is possible that some of the measurements given under *C. alba* may be intended for the present species.

61. (204.) *Carya tomentosa*. "Black Hickory"; "White-heart Hickory"; "Bull-nut."

A very common tree in upland woods, growing frequently more than 100 feet high and 3 feet or more in diameter, one specimen measuring 112 feet in length, 10½ in circumference, the trunk 55 feet.

62. (207.) *Quercus alba*. White Oak.

Perhaps the most abundant and generally distributed of all our trees, growing to a large size, especially in the bottoms, where trees of this species 130 feet or more in height and 3 feet in diameter are not uncommon. Indeed, even in upland woods, the average height of the larger White Oaks is 100 feet or more. Ten trees, cut for rails, on one piece of ground, averaged as follows: Total length, 100.05 feet; trunk, 40.1 feet; diameter (across top of stump), 2¾ feet. All but one grew on high ground. The extremes of size were: height, 87 to 111 feet; trunk, 26 to 54 feet; diameter, 2 feet 3 inches to 3 feet. One, measuring 2 feet 4 inches in diameter and 98 feet in height, exhibited 190 annual rings of growth. All but one were perfectly solid, and the one exception was hollow only in the stump, the first cut being sound. The tallest and largest tree grew at the edge of the creek bottoms, its height being 111, trunk 54, and diameter 3 feet. In rich bottom lands the size averages

considerably greater, or about 120 feet in height by 3½ to 4 in diameter, very large trees having an ambitus of 75 to 95 feet. The following measurements show pretty well the difference in size between trees growing in rich bottoms and those growing in the drier upland woods:

Size of White Oak trees growing in bottom lands, as measured.

	Diameter.	Trunk.	Height.	Ambitus.	Locality.	Authority.
a	3.39	65	128	.....	Knox County, Indiana.....	R. R.
b	3.55	.....	111	.....	do.....	Do.
c	4.83	40	123	.....	do.....	Do.
d	3.66	.....	121	.....	do.....	Do.
e	3.00	54	111	.....	do.....	Do.
f	5.00	60	115	.....	Posey County, Indiana.....	Thos. J. Johnston.
g	5.10	54	110	.....	do.....	Do.
h	5.50	30	142	.....	Wabash County, Illinois.....	R. R.
i	5.83	.....	.....	.....	do.....	Do.
j	.....	68	125	.....	do.....	Do.
k	6.00	60	150	.....	do.....	Dr. J. Schneck.
Av.	4.59	52	123.60			

Size of White Oak trees growing on uplands.

l	2.50	56	104.50	.....	Knox County, Indiana.....	R. R.
m	2.83	39	99	.....	do.....	Do.
n	2.33	36	98	.....	do.....	Do.
o	2.25	38	99	.....	do.....	Do.
p	2.33	43.50	103	.....	do.....	Do.
q	2.25	41.50	109	.....	do.....	Do.
r	2.25	30	93	.....	do.....	Do.
s	2.50	35	87	.....	do.....	Do.
t	2.33	38	97	.....	do.....	Do.
Av.	2.40	40	99.82			

The following measurements are given in Mr. Johnston's list, but it is not stated whether the trees grew in uplands or in the bottoms; most probably the former, however:

	Diameter.	Trunk.	Height.	Locality.	Authority.
u	4.50	45	97	Posey County, Indiana.....	Thos. J. Johnston.
v	4.40	48	107	do.....	Do.
w	4.33	43	95	do.....	Do.
x	4.12	35	87	do.....	Do.
Av.	4.34	43	94		

The White Oak begins to leaf, near Mount Carmel, about the 12th of April.

63. (269.) *Quercus bicolor*. Swamp White Oak.

A very common, or in some places abundant, tree, fully equal to *Q. alba* in size, but more resembling in form *Q. macrocarpa*. Only two specimens have been measured; one of these, a somewhat decayed prostrate one, measured 4 feet 8 inches across the top of the stump (not including the bark), the trunk 67 feet to the first limb; the topmost branches were gone, but at 100 feet from the base the five limbs were 10 inches to 1 foot in diameter, so that the tree when standing must have been 130 feet or

more high. The extreme base was hollow. The other was a standing tree, measuring $15\frac{1}{2}$ feet girth at four feet from the ground, the trunk about 20 feet, and the total height 100 feet or more. The top was widely spreading, probably measuring nearly or quite 100 feet ambitus.

64. (213.) *Quercus coccinea*. Scarlet Oak; "Black Oak" (?).

This tree is apparently not popularly distinguished from *Q. tinctoria*. Dr. Schneef, in his catalogue, gives the maximum measurements of this species as $20\frac{1}{2}$ feet girth, 94 feet trunk, and 181 feet total height. I am unable to give measurements of my own, however. It is apparently our tallest oak, though I had supposed *Q. rubra* to be entitled to this distinction.

65. (218.) *Quercus falcata*. Spanish Oak.

Common, along with *Q. nigra* and *Q. imbricaria*, in poor soils. Very rare in rich grounds, only one tree being seen in the bottoms; this a very large one near White River, in Gibson County. It measured 14 feet in circumference, and was estimated to be 130 feet high, with a crooked trunk of 60 to 70 feet clear. The bark was remarkably light colored, appearing almost as pale as some of the white oak section, but the leaves, a number of which were obtained (the date being November 2, and the ground beneath the tree covered with them, while many, still adhering to the branches, afforded proof that those on the ground were from the same tree), were unquestionably those of *Q. falcata*. A photograph of this tree is in my possession, and specimens of the leaves were deposited in the herbarium of the Agricultural Department. As usually found growing, however, in drier and poorer soils, this oak is by no means a large tree, seldom exceeding 80 feet in height, and probably not averaging over 50 or 60 feet, with a diameter of 1 to 2 feet.

66. (222.) *Quercus imbricaria*. Laurel Oak; Shingle Oak.

With possibly the exception of *Q. alba*, this is the most abundant and generally distributed species, at least in Wabash County. It is the most slender of all the oaks, and in some rich bottoms trees 100 feet in height and 50 feet to the limbs are only 6 to 7 feet in girth; one tree, however, measuring nearly 4 feet in diameter (11 feet in circumference) and over 100 feet high, has been measured. The largest prostrate tree measured was 100 feet long, 50 feet to the first limb, and $6\frac{1}{2}$ feet in girth. It is only in very rich lands, however, that this species attains such large dimensions, and on poorer soils, where it is more abundant, it does not usually much exceed half this size.

Flowers May 9 to 12, leafing about the 2d or 3d of the same month.

67. (226.) *Quercus lyrata*. Overcup Oak; Swamp Post Oak.

Not uncommon in some places, but very local—more so, indeed, than any other of our oaks. It is confined almost entirely to the low "swales" or depressions in the bottom lands, where the ground is either often over-

flowed or very wet for the greater part of the year, and in such places is found along with the "swell-butt" ashes (*Fraxinus americana*) and other swamp trees. In general appearance it very closely resembles the Swamp White Oak (*Q. bicolor*), branching, like that species, comparatively near the ground, the lower branches drooping so as to often touch the ground at their extremities. It is a smaller tree, however, no specimens exceeding 80 feet high and 2½ in diameter having been noticed, though, like other species, it may occasionally much exceed its usual size.

68. (227.) *Quereus macrocarpa*. Bur Oak.

Very common in rich bottom lands. Much the largest, though not the tallest of all our oaks, being frequently 5 to 6, sometimes 7, feet in diameter, and 130 feet or more high, with an ambitus of 100 feet or more. Dr. Schneck gives the maximum dimensions of the Bur Oak as follows: Circumference, 22; clear trunk, 72; total height, 165. Trees of this size are exceedingly rare, however, if not wholly exceptional. The largest that I have measured was 124 feet long to where the top branches had been broken off, the trunk 63 feet in the clear and 21 feet in circumference, the measurements, in the same order, of the next largest being 162, 30, and 20 feet. A standing tree more than 5 feet in diameter (16 feet circumference) had an ambitus of 130 feet in one direction and 134 feet the opposite way.

Following are the measurements that I have taken of this tree, including several by Mr. Thos. J. Johnston and Dr. Schneck:

Specimen.	Girth.	Trunk.	Height.	Ambitus.	Locality.	Authority.
<i>a</i>	18.25	35	75	.....	Posey County, Indiana ..	Thomas J. Johnston.
<i>b</i>	17.20	37	80	.....	do	Do.
<i>c</i>	14.65	31	77	.....	do	Do.
<i>d</i>	12.75	32	76	.....	do	Do.
<i>e</i>	19.50	70	149	.....	Wabash County, Illinois..	Dr. J. Schneck.
<i>f</i>	20	30	162	.....	do	R. R.
<i>g</i>	21	.....	.....	.....	Posey County, Indiana....	Charles Schneck.
<i>h</i>	18	40	130	.....	do	Do.
<i>i</i>	18.50	66	.....	100	Wabash County, Illinois..	R. R.
<i>j</i>	15	60	140	.....	do	Do.
<i>k</i>	21	63	+124	.....	do	Do.
<i>l</i>	16	.....	.....	130×134	do	Do.
<i>m</i>	22	72	165	.....	Wabash County, Illinois(?)	Dr. J. Schneck.
Average ..	17.95	48.73	+115.80	.....	

REMARKS.—*e*, trunk perfectly solid throughout; *g*, "trunk apparently sound"; *h*, trunk sound.

69. (—.) *Quereus michauxi*?

To this species I refer provisionally an oak which is not a common species in the vicinity of Mount Carmel (the only place I have seen it), but which grows sparingly in rich alluvial soils. So far as I have observed, it is rather a small species, resembling in general appearance the *Q. muhlenbergi* more than any other of our oaks, but having very different fruit and foliage. The leaves, 3.25 to 7.00 inches long and 1.50 to 3.50

wide, are obovate, acute at each end, *long petioled* (petiole .70 to 1.50 long), *coriaceous, very glossy above, pale and very velvety beneath*, the margin deeply cuspidate-toothed. The acorn is very large (.90 to 1.00 inch long by the same in breadth), broadest at the base, the summit somewhat depressed, the color a rich leather-brown; cup saucer-shaped, flattish beneath, *very thick*, velvety inside, roughly clad exteriorly with very distinct and prominent elaw-like, somewhat carinate scales, the margin thin, and turned slightly outward; peduncle very short (.30 or less) or wanting, the acorn being usually sessile. This tree can hardly be a form of *Q. bicolor* (to which *Q. michauxi* is referred by Dr. Englemann), its principal characters being directly the reverse of those of that species. Thus, the leaves of *Q. bicolor* are very short-petioled or almost sessile, while those of the present species have the petiole an inch or more, frequently an inch and a half in length; in *Q. bicolor* the acorn is attached to a longer peduncle than any other of our oaks (usually 2 inches or more in length!), while in this species, if present at all, it does not exceed .30 of an inch! The acorn of *Q. bicolor* is also very much smaller, and of a *totally* different character.

Whatever this species may be, I leave it for botanists to decide.*

70. (228.) *Quercus muhlenbergi*. "Yellow Oak"; "Chinquapin" (!).

This fine tree is a very common species in the bottom lands as well as on rich hillsides. The trunk may be recognized at a distance by its thin-scaled, very light-colored bark, and tall slender growth, this oak being probably the tallest in proportion to its diameter of any of the white-barked species. One felled tree measured 130 feet in length, the trunk 40 feet, and the circumference 13 feet; another (a photograph of which, taken before the tree was cut, is in my possession) was 122½ feet long, 73 feet to the first limb and 84 feet to the main fork, the diameter across the top of the stump being only 3½ feet! A standing tree, whose height could not be ascertained, was 14 feet in circumference above the spurred base, which, at the ground, measured 10 feet in diameter.

The acorns of this tree are very small and sweet, much resembling in both appearance and taste, and certainly not inferior to, the nuts of the Chinquapin (*Castanea pumila*), whence the popular name. The wood is said to be tougher than that of *Q. alba*, and is much used by wagon-makers.

71. (229.) *Quercus nigra*. "Black Jack"; "Jack Oak."

A very abundant species in poor, sandy soils, growing 30 to 50 feet high and 8 inches to 1½ feet diameter, being, perhaps, the smallest of all our oaks. No actual measurements having been made, it may be that the dimensions given above are sometimes exceeded.

* Since the above was written, Professor Sargent writes me as follows: "This is, no doubt, *Q. michauxi*, and it must now be considered a good species. It is one of the most beautiful and useful of the American oaks."

72. (231.) *Quercus palustris*. "Water Oak"; "Turkey Oak."

A very common species in wet bottoms, distinguished by its comparatively smooth, grayish bark, and usually by the numerous small drooping branches which grow from the trunk, sometimes to quite near the ground. In close woods, however, it frequently has a clean straight stem of 50 feet or more, one of 73 feet having been measured. The Water Oak is usually 100 to 120 feet high, and 2 to 3 feet in diameter, but much larger specimens sometimes occur, trunks even 4 and 5 feet through being occasionally met with. But few specimens have been measured, as follows:

	Girth.	Trunk.	Height.	Locality.	Authority.
a	6	73	116	Wabash County, Illinois.....	R. R.
b	12	23	120	Wabash County, Illinois (?).....	Dr. J. Schneck.
c	9½	61	119	Knox County, Indiana.....	R. R.
d	9	55	117	.....do.....	Do.

This species blossoms about the middle of April.

(?) 73. (232.) *Quercus phellos*. Willow Oak.

This species I give with some doubt, not being quite positive that it occurs. I have seen, however, along the road between Mount Carmel and Olney (Richland County) several trees which, at the time of inspection, I unhesitatingly decided to be *Q. phellos* (a tree with which, as growing in Maryland and Virginia, I was perfectly familiar), but not having seen it since, while Dr. Schneck has not recorded it, I place the interrogation mark as above.

74. (234.) *Quercus rubra*. Red Oak; "Spanish Oak"; "Turkey Oak."

With the possible exception of *Q. coccinea*, this is the tallest oak growing in the district under consideration, and, excepting *Q. macrocarpa*, is the largest also. Trunks, straight as an arrow, of 5 or even 6 feet diameter (above the spurs), and 50 to more than 70 feet clear, were formerly not at all rare, but at the present time most of them have been cut for barrel-staves or clap-boards. The largest Red Oak which I have measured was 23 feet in girth (round the top of the stump), the trunk 76 feet long and 3 feet in diameter at the small end. The top branches beyond 120 feet from the base were destroyed, but at this point the several main limbs were a foot in thickness. Another tree, measuring 19 feet in girth and 71 feet to the first limb, was 150 feet long. At the ground these large Red Oaks measure much more than they do a few feet up, on account of the projecting spurs, or buttresses, which, as in the White Elm (*Ulmus americana*), are a very characteristic feature of the species. Thus, a Red Oak measuring 6 feet through at two yards from the ground may be 12 feet or more in diameter at the base.

Flowers April 18 to 20, and leaf out a few days later.

The extent to which this tree is cut for barreil-staves and clapboards has afforded the opportunity of taking several measurements, which are herewith appended:

	Girth.	Trunk.	Height.	Locality.	Authority.
<i>a</i>	23	76	.....	Gibson County, Indiana	R. R.
<i>b</i>	13	60	150	Wabash County, Illinois	R. R.
<i>c</i>	12	.....	125	.....do	R. R.
<i>d</i>	19	71	150	.....do	R. R.
<i>e</i>	12	63	130	.....do	R. R.
<i>f</i>	14	65	.....	.....do	R. R.
<i>g</i>	11.50	40	132	.....do	R. R.
<i>h</i>	17	62	.....	Gibson County, Indiana	R. R. (Photographed.)
<i>i</i>	16	60	.....	Wabash County, Illinois	R. R.
<i>j</i>	15	75	.....	.....do	R. R.
<i>k</i>	15	72	.....	Gibson County, Indiana	R. R.
<i>l</i>	14.50	54	134	Knox County, Indiana	R. R.
<i>m</i>	9	57	115	.....do	R. R.
<i>n</i>	11	62	115	.....do	R. R.
<i>o</i>	14	55	143	.....do	R. R.
<i>p</i>	9	65	127	.....do	R. R.
Av.	14.00	62.50	132.10		

REMARKS.—*a*, trunk 3 feet in diameter at upper end; at 120 feet branches 1 foot thick; *h*, circumference at ground, 36 feet; *i*, circumference at ground, 28 feet; *j*, diameter at ground, 11 feet; *k*, diameter across stump, over spurs, 6 feet; through upper end of trunk, 3 feet; *l*, 181 annual rings to central hollow, 15 inches across; *n*, 242 annual rings.

75. (235.) *Quercus stellata*. Post Oak.

A very common tree in clay soils. No measurements have been taken, but the usual size of the heavier growth is about 50 to 80 feet high, and 2 to 3 feet in diameter. Larger trees, however, no doubt occur.

76. (236.) *Quercus tinctoria*. Black Oak.

A very common, large tree, chiefly in upland woods. Frequently 100 feet or more in height, and 3 feet in diameter. It is occasionally larger, however, as may be seen from the annexed measurements.

	Girth.	Trunk.	Height.	Locality.	Authority.
<i>a</i>	9	39	100	Knox County, Indiana	R. R.
<i>b</i>	18	75	128	Posey County, Indiana	Thomas J. Johnson.
<i>c</i>	17½	60	118	.....do	Do.
<i>d</i>	20	50	102	.....do	Do.
<i>e</i>	14	49	100	.....do	Do.
<i>f</i>	12½	43	96	.....do	Do.
<i>g</i>	20	75	160	Wabash County, Illinois (?)	Dr. J. Schneek.

REMARKS.—*a*, 179 annual rings.

Flowers April 17th to 20th, and begins to leaf about a week later.

77. (242.) *Castanea vulgaris americana*. American Chestnut.

The chestnut does not properly belong to the district under consideration, but in Indiana extends westward very nearly to the junction of the two forks of White River, having been noticed from the railroad,

growing wild between Loogootee and Shoals, in Martin County, the second county east of Knox. In Jackson and other counties in the southern and southeastern part of the State it is abundant, and grows to a large size, a specimen near Seymour, being mentioned in *Case's Botanical Index*, which measured 22 feet in circumference 2 feet from the ground, and 70 feet to the first limb.

A few trees, raised from imported seed, are to be found in various parts of Wabash County, where they grow finely, and under proper conditions, fruit plentifully. Trees near Mount Carmel flower about March 20, and begin to leaf about the middle of April.

78. (243.) *Fagus ferruginea*. Beech.

I have never seen, nor, indeed, heard of a single beech tree growing on the Illinois side of the Wabash; but immediately across the river, in Knox County, Indiana, a few large trees begin to occur, while back on the hills of both that county and Gibson it is a very common tree. Trees of 3 to 4 feet diameter are not uncommon, while Dr. Schneck records one which measured 122 feet in height. Ordinarily, however, the finest beech trees are decidedly inferior in altitude to the surrounding oak, gum, and other tall forest trees, and I should estimate their average height at not more than 90 feet.

79. (244.) *Ostrya virginica*. Hop Hornbeam.

By no means a common tree, but occasionally found, and possibly more numerous in some localities not visited. No measurements.

80. (245.) *Carpinus caroliniana*. "Blue Beech"; "Water Beech."

Very common in rich bottom lands. The largest trees measured were 30 to 32 feet high, and 1 to 1½ feet in diameter, but larger ones may occur. Only four trees were measured, their dimensions being as follows:

	Girth.	Trunk.	Height.	Locality.	Authority.
a	4½	.....	30	Knox County, Indiana	R. R.
b	3½	10	30	.....do	Do.
c	.....	.....	31	Wabash County, Illinois	Do.
d	3½	7½	32	Knox County, Indiana	R. R. Ambitus 35 feet.

81. (247.) *Betula lenta*. Cherry Birch; "Black Birch"; "Mahogany Birch."

Not uncommon along banks of streams. One tree, forking several feet from the ground, measured 17½ feet in circumference, and was about 80 feet high.

82. (249.) *Betula nigra*. Red Birch; River Birch.

Commoner than the last in similar situations. Young trees, as well as some old ones, with very scaly bark, the projecting laminae very thin, paper-like. Grows commonly 70 to 80 feet high, and occasionally 3 or

even 4 feet in diameter. The only one actually measured was 84 feet in length.

83. (260.) *Salix lucida*. Shining Willow.

"Moist banks of streams; common." (SCHNECK.) No measurements.

84. (——.) *Salix discolor*. Glaucous Willow.

"Moist banks and along stream; rare." (SCHNECK.) No measurements.

85. (261.) *Salix nigra*. Black Willow.

Much the most abundant and also by far the largest of our native willows. In some swamps the trees of this species average 60 to 70 feet high and more than a foot in diameter, while trees considerably larger are occasionally met with. Two trees growing on the border of Monteur's Pond, in Knox County, Indiana, measured, respectively, 80 and 87½ feet in length, the latter being more than 3 feet in diameter (10 in girth), the former 7½ feet in circumference, and 18½ feet to the first limb. One cut expressly for measurement, near the mouth of Crawfish Creek (Wabash County, Illinois), was 77 feet long, 55 feet to the first limb, and only 2½ feet around! Two other trees, measuring respectively 8½ and 9 feet in girth, were also measured, the former being 30 feet to the first limb.

86. (266.) *Populus heterophylla*. "River Cottonwood"; "Swamp Cottonwood"; "Stupy Gum" (Knox County, vern.).

Very common about the borders of swamps, usually associated with the Black Willow (*Salix nigra*). Much inferior in size to *P. monilifera*, the largest trees scarcely exceeding 90 feet in height and 2 to 2½ in diameter. The trunk, however, is usually very long in proportion, frequently occupying two-thirds or more of the total length. Only three trees of this species have been actually measured, the following being their dimensions:

	Girth.	Trunk.	Height.	Locality.	Authority.
a	7½	34	88	Knox County, Indiana.....	R. R.
b	7½	51	92	.....do	R. R.
c	7½	38	80	.....do	R. R.

87. (267.) *Populus monilifera*. Cottonwood; "Big Cottonwood."

A very common tree in rich bottom lands and along the alluvial banks of streams, where it occasionally attains an immense size and altitude. Trees of 5 to 6 feet diameter are not uncommon, while trunks of 7 or even 8 feet are occasionally to be met with; the stem being usually more than 50 feet clear. The total height of the tallest cottonwoods is gen-

erally more than 130 feet, as may be seen from the following measurements:

	Girth.	Trunk.	Height.	Locality.	Authority.
<i>a</i>	9	40	140	Wabash County, Illinois.....	R. R. (Coffee Creek bottoms.)
<i>b</i>	16	.....	.....	do.....	Do.
<i>c</i>	16	.....	.....	do.....	Do.
<i>d</i>	18	70	165	Posey County, Indiana.....	Charles Schneck.
<i>e</i>	19	75	134	do.....	Do.
<i>f</i>	14	15	130	Wabash County, Illinois.....	Dr. J. Schneck.
<i>g</i>	24	.....	.....	Gibson County, Indiana.....	R. R. (Photographs.)
<i>h</i>	20	.....	.....	do.....	Do.
<i>i</i>	20	.....	.....	do.....	Do.
<i>j</i>	18 $\frac{1}{2}$	75	170	Wabash County, Illinois (!).....	Dr. J. Schneck.
<i>k</i>	11	58	114	Knox County, Indiana.....	R. R.

REMARKS.—*f*, a very fine tree, formerly standing on the commons within the corporation limits of Mount Carmel, but destroyed by the tornado of June 4, 1877; height measured by its shadow, the result verified by subsequent tape-line measurement; *g*, *i*, three majestic trees standing near together on the bank of a bayou opposite Rochester, the gradually tapering trunks estimated to be 70 to 80 feet clear, the total height of the tree is nearly 150 feet. In the immediate vicinity many others nearly as large (5 to 6 feet through).

88. (268.) *Populus tremuloides*. Aspen; "Quaking Asp."

A very rare tree in upland woods of Wabash County, but common in both uplands and bottoms near Monteur's Pond, in Knox County, Indiana, where it forms a small slender tree, 50 to 70 feet high and 6 inches to a little over a foot in diameter. Only two trees were measured, one, blown over by the wind, but still growing, being 71 feet long and 1 foot 2 inches in diameter; the other, cut for measurement, being 51 $\frac{1}{2}$ feet long, though only 14 inches in circumference at the base, and measuring 24 feet to the first limb.

89. (277.) *Juniperus virginiana*. Red Cedar.

Not native, so far as known, in any part of Wabash County, nor adjoining counties in Indiana, the soil being everywhere far too rich for it. It is abundant, however, on the hills of Gallatin County, near the mouth of the Wabash. The miniature *J. communis* is found sparingly in Wabash and adjoining counties, but becomes only a small bush in stature.

90. (283.) *Chamæyparis sphaeroidea*. White Cedar. "Wet places near the mouth of the Wabash River." (SCHNECK.) Not seen by me; no measurements.

91. (287.) *Taxodium distichum*. Bald Cypress; "Cypress."

I have never heard of any cypress growing anywhere on the Illinois side of the Wabash, but in the lower part of Knox County, Indiana, or that portion embraced between the Wabash and White Rivers, and known as "The Neck," it is very abundant, the area embraced by the cypress swamps of that district, and largely timbered with cypress, being estimated at 20,000 acres (see Cox's *Geological Survey of Indiana*, 1873, p. 338). The cypress swamps of this region comprise two quite distinct

tracts, of which the northern is very much the larger, its natural outlet being the river Deshee, which empties into the Wabash between Mount Carmel and Vincennes. The "Little Cypress Swamp" is situated immediately above the mouth of White River, into which it empties through what is termed the "White River Slough." Although known as the "Cypress Swamp," it consists of a series of beautiful, secluded ponds, hidden in the dense forest, and difficult of access by any one not familiar with the locality. The principal ponds are the Cypress, Beaverman, Washburne's, and Forked Ponds, of which Washburne's is perhaps the largest. The cypress trees here grow chiefly around the borders of these ponds and along the sloughs connecting them, as well as the one which empties into the river. Being so near the river, into which the logs are floated at "high water," the finest trees have long since been destroyed, and there are very few left whose symmetry is not marred by low-growing branches or knots upon the trunks. The largest standing tree observed by me was a very old and exceedingly rough specimen, entirely unfit for lumber or shingles. The swollen base measured 45 feet in circumference at the ground, the girth immediately above the conical portion being 21 feet; the trunk consisted of several upright stems grown together for the greater part of their length, but in places distinct, with one very conspicuous transverse growth joining the two main stems, at a height of about 50 feet from the ground. The top expanded 94 feet, the greater part of it elevated over 100 feet from the ground. A solid stump, measuring 38 feet around at the ground, was 22 feet in girth at 8 feet; at about 15 feet it divided into two main trunks of equal size, which were cut off immediately above the fork, a scaffold being necessary for the purpose. Another stump was 13 feet in diameter across the top, but was hollow, and from its decaying wood grew several tall, but slender, birch trees, some of which were 50 feet high. Several other stumps of 9 and 10 feet in diameter (across the top) were measured. Several single, solid trunks of 50 to 92 feet in the clear were measured, their diameter at the base being 3 to 5 feet, while the largest one measured, a standing tree, was 27 feet in girth above the swollen base. The tallest of these trees did not, however, much exceed 140 feet (the two tallest measured being 146 and 147 feet), their average height being little, if any, over 100 feet; and even the finest of them would not compare for symmetry and length with the Sweet Gums and Ashes with which they were associated.

92. (324.) *Pinus mitis?* Yellow Pine.

For obvious reasons there are no pines growing native in Wabash or adjoining counties of Illinois or Indiana; but, according to Dr. Schneck (catalogue, p. 562), the Yellow Pine occurs on the "hills near the mouth of the Wabash River, in Gallatin County, Illinois." Professor Sargent, however, suggests that the pine of Southern Illinois may be *P. inops*, which "is common and reaches its best development on the 'Knobs' of Southeastern Indiana."