

PLANTS OF SPRING MILL STATE PARK, LAWRENCE  
COUNTY, INDIANA: I—FERNS

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For about four weeks during August and September, 1931, the writer was permitted to botanize at Spring Mill State Park, Lawrence County, Indiana. The relatively new park consists of over one thousand acres, largely wooded, but with some abandoned fields. The residual soils are derived from the Mitchell limestone. The topography is typical karst, with literally one sinkhole after another. Hamer's Creek, arising from a cave near the more than century old village, which is being reconstructed, joins a system of surface drainage, with, however, very little marshy ground. Generally speaking, the fern flora is not very rich. Twenty-one species are listed as observed and collected. Five other species, fairly common, most certainly should be found within the park area. They are: *Pteris aquilina* L., *Aspidium noveboracense* (L.) Sw., *Aspidium spinulosum* var. *intermedium* (Muhl.) S. C. Eaton, *Cystopteris fragilis* (L.) Bernh., and *Ophioglossum vulgatum* L.

The appearance of short, local lists such as the ones in this series are hardly justified except by their utility, for example, in connection with nature guiding carried on by the Indiana Department of Conservation under the guidance of Mr. Sidney Esten. The writer wishes to thank the Department of Conservation for courtesies extended in connection with this work. Herbarium sheets are deposited at Indiana University and with the Department of Conservation. Nomenclature according to Gray's Manual, 7th ed.

POLYPODIACEAE

*Phegopteris hexagonoptera* (Michx.) Fee. Beech fern, in good fruit, Aug. 21, 1931. Common in woods. No. 75.

*Adiantum pedatum* L. Maidenhair fern, in good fruit, Aug. 21, 1931. Common in woods and thickets. No. 76.

*Pellaea atropurpurea* (L.) Link. Purple Cliffbrake, in good fruit, Aug. 25, 1931. Scarce on rocks (limestone) above the mouth of Donaldson's Cave. No. 108.

*Asplenium platyneuron* (L.) Oakes. Spleenwort, past fruit, Aug. 20, 1931. Common near the far end of trail 2, under *Juniperus virginiana* on limestone rocks with *Woodsia obtusa*. The soil frequently becomes very dry. No. 64.

*Asplenium angustifolium* Michx. Narrowleaved Spleenwort, in good fruit, Aug. 20, 1931, along the west end of trail 2. Sterile fronds are much more abundant than fertile fronds. No. 56.

*Asplenium acrostichoides* Sw. Silver Spleenwort, in good fruit, Aug. 20, 1931. Rich woods. No. 54.

"Proc. Ind. Acad. Sci., vol. 41, 1931 (1932)."

*Asplenium Filix-focmina* (L.) Bernh. According to Gray's Manual, 7th Ed. The true identity of this plant, according to more recent botany, has not been determined by the writer. Lady fern, in good fruit, Aug. 27, 1931. In woods, scarce. No. 148.

*Camptosorus rhizophyllus* (L.) Link. Walking fern, past the fruiting prime, Aug. 21, 1931. Limestone rocks and cliffs, common. No. 77.

*Polystichum acrostichoides* (Michx.) Schott. Christmas fern, past the fruiting prime, Aug. 20, 1931. In woods, very common. No. 55.

*Polystichum acrostichoides* (Michx.) Schott. var. *Schweinitzii* (Beck) Small. Incised Christmas fern. The species shows all degrees of serration to typical incised plants recognized as the variety. With the species.

*Aspidium marginale* (L.) Sw. Marginal Shield fern. This species was not collected in 1931, but the writer and Dr. Friesner of Butler University found it within the park area in 1921. It used to grow near the mouth of Donaldson's cave and has probably been eliminated by the spread of *Vinca minor* L. which has escaped from Donaldson's home site and the monument to Wilson, nearby. Although the Periwinkle makes a handsome appearance it is a very serious menace to the native herbs.

*Aspidium Goldianum* Hook. Goldie's Shield fern was also collected by Dr. Friesner and the writer in 1921. It was not observed in 1931.

*Cystopteris bulbifera* (L.) Bernh. Bulb fern, indusia were in poor shape but the bulbs were plentiful, Aug. 21, 1931. Very common on limestone rocks and hillsides where the soil is thin, in woods. No. 78. Some of the low soil forms were difficult to distinguish from *C. fragilis* (L.) Bernh. in the absence of bulbs.

*Woodsia obtusa* (Spreng.) Torr. This *Woodsia* is especially common under Juniper on limestone rocks. Fruit over-ripe, Aug. 20, 1931. No. 63.

*Onoclea sensibilis* L. Sensitive fern, not fruiting, Sept. 4, 1931. In a sink hole in the virgin forest north of the road near the largest yellow poplar in the park. No. 178.

#### OSMUNDACEAE

*Osmunda claytoniana* L. Interrupted fern, not fruiting, Sept. 4, 1931. In second-growth oak on hill-top. No. 177.

#### OPHIOGLOSSACEAE

*Botrychium virginianum* (L.) Sw. Rattlesnake fern, past fruiting, Aug. 20, 1931. Common in woods. No. 65.

*Botrychium obliquum* Muhl. Grape fern, not in fruit, Sept. 4, 1931. Rare in rich woods. No. 175.

*Botrychium obliquum* Muhl. var. *dissectum* (Spreng.) Clute. Dissected Grape fern, not in fruit, Sept. 4, 1931. Rare in virgin forest. No. 176.

#### EQUISETACEAE

*Equisetum arvense* L. Common Horsetail, sterile stems only, Aug. 26, 1931. Hamer's Creek. No. 123.

*Equisetum hyemale* L. Scouring Rush, not in fruit, Aug. 26, 1931. Common along B. & O. R. R. No. 143.

PLANTS OF SPRING MILL STATE PARK, LAWRENCE  
COUNTY, INDIANA: II—TREES, SHRUBS  
AND WOODY VINES

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The nomenclature of the following list is in accord with that of Sudworth in his "Check List" of the Forest Trees of the United States" 1927, and Rehder's "Manual of Cultivated Trees and Shrubs," 1927. It is the writer's pleasure to thank Mr. Charles C. Deam of Bluffton, Indiana, for corrections and valuable suggestions. One hundred and nine woody species, of which all but eight are native, are listed from an area of a little over one thousand acres. Seventy-one are trees, two of which are escaped from cultivation (*Pinus virginiana* and *Ailanthus*) and 38 are shrubs, two of which are escaped (*Vinca* and *Lonicera japonica*). Since the collections were made in late summer when none were in flower it is possible that some changes in the list will have to be made. Some species will undoubtedly be added to the list as this new Park becomes better known. In addition to possible species in the genera *Salix*, *Rubus*, and *Crataegus* the following species are to be looked for: *Quercus bicolor* Willd. Swamp White Oak, *Amelanchier canadensis* (L.) Med. Serviceberry, *Gymnocladus dioica* (L.) Koch. Coffeetree, *Robinia pseudoacacia* L. Black Locust, *Aesculus glabra* Willd. Ohio Buckeye, *Fraxinus quadrangulata* Michx. Blue Ash, *F. nigra* Marsh. Black Ash, *Alnus rugosa* (DuRoi) Spreng. Alder, *Rosa palustris* Marsh. Swamp Rose, *Rhus canadensis* Marsh. Fragrant Sumach (at Clifty Cave, Orange County) and *Cephalanthus occidentalis* L. Buttonbush. Sheets of the following species and varieties are deposited in the herbarium of Indiana University, Bloomington, and with the Department of Conservation, Indianapolis. For convenience the list is alphabetical.

\**Abies alba* Mill. Silver Fir. Planted at the village.

*Acer negundo* L. Boxelder Maple, infrequent, Mill Creek.

*A. nigrum* F. A. Michx. Black Maple, Aug. 19, 1931. Less common than the preceding. No. 45.

*A. rubrum* L. Red Maple, Aug. 19, 1931. Abundant, especially younger stages, in woods. No. 27.

\**A. saccharinum* L. Silver Maple, Aug. 26, 1931. Planted in Hamer's Cemetery. Should be found wild. No. 129.

*A. saccharum* Marsh. Sugar Maple, Aug. 19, 1931. Abundant in woods. No. 28.

*A. saccharum rugelii* (Pax.) Rehder. Sugar Maple, Aug. 29, 1931, good fruit. Woods near Upper Twin Cave. Leaves broader than long, pubescent beneath, smooth on the petioles and with three main attenuated lobes. This variety seems abundant and frequently well-marked from the Sycamore Creek region, Morgan County, southward. Common outside the Park in Lawrence and Orange counties. No. 173.

\* Means, planted.

†*Ailanthus altissima* (Miller) Swingle. *Ailanthus*, Aug. 29, 1931. Escaped near Donaldson's Cave.

*Amelanchier laevis* Wiegand. Serviceberry, Aug. 25, 1931. This smooth species is found on the steep slopes above Donaldson's Cave and in the virgin forest. No. 102.

*Ampelopsis cordata* Michx. Heartleaf Ampelopsis, Aug. 27, 1931. Usually near streams but here along the railroad. No. 166.

*Ascyrum hypericoides* L. St. Andrews' Cross, Sept. 22, 1931. Open oak woods near Upper Twin Cave. No. 273.

*Asimina triloba* (L.) Dunal. Papaw, Aug. 20, 1931. Occasional in the virgin forest, sometimes in thickets. No. 58.

*Benzoin aestivale* (L.) Nees. Spice Bush, Aug. 20, 1931. Common undershrub in the richer woods. No. 59.

*Campsis radicans* (L.) Seemann. Trumpet-Creeper, Aug. 24, 1931. In open places. No. 87.

*Carpinus caroliniana* Walt. Blue Beech, Aug. 19, 1931. Very common small tree in climax woods. No. 43.

*Carya* (see *Hicoria*).

*Ceanothus americanus* L. New Jersey Tea, Aug. 27, 1931. Fields and open woods, fairly common. No. 167.

*Celastrus scandens* L. Bittersweet, Aug. 19, 1931. Common in open woods and especially along fences and the railroad. No. 33.

*Celtis occidentalis* L. Hackberry, Aug. 27, 1931. Woods west of the orchard, not frequent. No. 150.

*C. pumila* (Muhl.) Pursh. Dwarf Hackberry, Aug. 19, 1931. This very interesting tree (See C. C. Deam, "Trees of Indiana," pg. 148) is common on dry hillsides in open woods but is also found in the virgin forest. No. 38.

*Cercis canadensis* L. Redbud, in open places, Sept. 4, 1931. No. 189.

*Clematis virginiana* L. Clematis, Aug. 20, 1931, in good fruit. This species is considered sufficiently woody to be included. It is the writer's opinion that as a general practice it is well to include such plants as Clematis, Mitchella, Gaultheria, Menispermum, etc., in woody lists as well as in herbaceous lists so that students can find them either place. No. 69.

*Cornus alternifolia* L. f. Blue Dogwood, Aug. 19, 1931. Frequent in deep cool ravines, as near Donaldson's Cave. No. 44.

*C. asperifolia* Michx. Roughleaf Dogwood, Aug. 20, 1931. Common in open woods and thickets. No. 70.

*C. florida* L. Dogwood, Aug. 24, 1931. Most abundant of small trees in the virgin forest and common elsewhere. No. 88.

*Corylus americana* Walt. American Hazel, Aug. 19, 1931. Common in thickets, along fences, etc., in good fruit. Nos. 34 and 57.

*Crataegus crus-galli* L. Cockspur Thorn, Aug. 25, 1931. This species is one of the few which can be identified with any surety without both flowers and fruits. Frequent in old fields and at the edge of woods. No. 112.

*C. margarete* Ashe. Aug. 25, 1931. Identification tentative in the absence of fruit and flowers. Old field. No. 114.

*C. succulenta* Link. Fleshy Hawthorn, Aug. 25, 1931. Good fruit, and the pitted character of the seeds fit the description well. Identification tentative, however, in the absence of flowers. In old field with

† Means, escaped from plantings, propagating spontaneously.

Silphium, Physostegia, Andropogon, etc., above Donaldson's Cave. No. 113.

*Diospyros virginiana* L. Persimmon, Aug. 25, 1931. Very common in old fields, a weed tree. There are several variants which deserve study. No. 118.

*Evonymus atropurpurea* Jacq. Wahoo, Aug. 19, 1931. Fruit ripe the latter part of the month. Common. No. 47.

*E. obovatus* Nutt. Trailing Wahoo, Aug. 21, 1931. Local under heavy shade, forming dense mats. No. 73.

*Fagus grandifolia* Ehrh. Beech, Aug. 24, 1931. Frequent member of all mesophytic woods, sometimes forming almost pure stands, as north of Hamers' Cemetery on the slopes to Mill Creek. No. 86.

*Fraxinus americana* L. White Ash, Aug. 19, 1931. Common in woods. No. 36.

*F. pennsylvanica* Marsh. Red Ash, Sept. 28, 1931. This species with pubescent twigs is like the green ash in many other respects. Common in woods. Nos. 62 and 239.

*F. pennsylvanica* var. *lanceolata* (Bork.) Sargent. Green Ash, Sept. 29, 1931. Apparently common. In the absence of fruit the species of *Fraxinus* are frequently hard to distinguish. Characteristic plants of green ash have flat-topped leaf scars with "ears," while the white ash leaf scar is concave topped, yet many plants are indefinite as to these characters, as well as matters of pubescence, leaf color, stoutness, etc. No. 240.

*Gleditsia triacanthos* L. Honey Locust, not collected.

*G. triacanthos inermis* Willd. Thornless Honey Locust, Aug. 27, 1931. On a hillside with oaks. One tree of this variety was over one foot d. b. h. and absolutely without thorns. The variety, however, was intermingled with the species and the character showed no intergradation. Hillside northeast of the village. No. 158. Deam writes "This form is supposed to be restricted to the Missouri area."

*Hamamelis virginiana* L. Witch-hazel. Not collected.

*Hicoria cordiformis* (Wang.) Britton. Bitternut Hickory, Sept. 29, 1931, in good fruit. Frequent in woods and openings. Nos. 32 and 241.

*H. glabra* (Miller) Sweet. Pignut Hickory, Aug. 20, 1931. Upland woods, even in the virgin forest, but especially in old fields where it grows well along with *Sassafras* and *Persimmon*. Good crop of the characteristic fig-shaped fruit. No. 51.

*H. laciniosa* (Michx. f.) Sargent. Bigleaf Shagbark Hickory. Aug. 25, 1931. Scattered in woods. No. 99.

*H. ovata* (Mill.) Britton. Shagbark Hickory, Aug. 27, 1931. This and the preceding were seldom found fruiting. No. 160.

*Hydrangea arborescens* L. *Hydrangea*, Aug. 25, 1931. Fairly common in ravines and near streams. No. 107.

*Juglans cinerea* L. Butternut, Sept. 4, 1931. Common along streams. No. 191.

*J. nigra* L. Black Walnut, Sept. 4, 1931. Infrequent, although there are a few trees of large size in the virgin forest. No. 190.

*Juniperus virginiana* L. Eastern Red Cedar, Aug. 19, 1931. Frequent in old fields. Forms a woods on limestone bluffs in the north-eastern part of the Park. No. 30.

*Liriodendron tulipifera* L. Tulip Tree, Aug. 25, 1931. The largest trees of the virgin forest are of this species. It frequently invades old

fields and sometimes when openings develop in woods it comes up in almost pure stands. No. 115.

\**Lonicera prolifera* (Kirch.) Rehder Honeysuckle, Aug. 26, 1931. Growing in the vicinity of Donaldson's home site. No. 127.

*L. prolifera* Rehder. Honeysuckle, Sept. 4, 1931. Woods. No. 183.

*Malus glaucescens* Rehder. Crab Apple, Aug. 29, 1931. Dry woods south of Upper Twin Cave. This plant has some of the characters of *M. ioensis* Britton. No. 174.

*Menispermum canadense* L. Moonseed. No collection.

*Morus rubra* L. Red Mulberry, Aug. 24, 1931. Virgin forest. No. 91.

*Nyssa sylvatica* Marsh. Black Gum, Aug. 19, 1931. Frequent in woods and old fields. No. 35.

*Ostrya virginiana* (Mill.) Koch. Hop-hornbeam, Aug. 19, 1931. Very common in the lower arborescent stratum of woods. No. 42.

*Parthenocissus quinquefolia* (L.) Planch. Virginia Creeper. Common in woods.

‡*Philadelphus inodorus* L. Mockorange, Aug. 26, 1931. Escaped in the vicinity of Wilson's monument. No. 125.

‡*Pinus virginiana* Mill. Virginia Pine, Aug. 26, 1931. Planted at the Donaldson's home site but not escaped from there because of the density of the surrounding woods. However, plants are to be found in the fields east of the virgin forest and northward a half-mile which have undoubtedly escaped from a grove of pine on the Bundy place about one-fourth mile south of the Park on route 60. This grove has spread over several acres. No. 137.

*Platanus occidentalis* L. Sycamore, Aug. 25, 1931. Common along streams. No. 116.

*Populus deltoides* Marsh. Eastern Cottonwood. No collection. One good-sized specimen stands near the gate house.

*P. grandidentata* Michx. Largetooth Aspen, Aug. 19, 1931. Old fields and thickets on high ground. No. 26.

*Prunus americana* Marsh. Wild Plum, Sept. 5, 1931. Thicket north of the gate house and route 60. No. 197.

*P. serotina* Ehrh. Black Cherry, Aug. 26, 1931. Woods. Seedling survival in the virgin forest seems to be good. No. 130.

*Ptelea trifoliata* L. Hoptree, Aug. 29, 1931. Infrequent, in woods near edge of Daltons' Cave. No. 170.

*Quercus alba* L. White Oak, Aug. 19, 1931. Most frequent and important tree in the virgin forest. The largest specimen is along the trail running back of Hamer's Cemetery towards the village. No. 29.

*Q. alba latiloba* Sargent. White Oak, Aug. 27, 1931. Two large trees distinctly of this variety were found on a hill near the Clouse place. Although there were no fruit for comparison, there was no mistaking the difference of these trees, even from a distance, from the species with which they were intermingled. No. 162.

*Q. coccinea* Muench. Scarlet Oak, Aug. 26, 1931. No fruit was found, so the identification is not positive. No. 132.

*Q. imbricaria* Michx. Shingle Oak, Aug. 19, 1931. Good fruit on trees situated at the edge of woods. Common. No. 25.

*Q. macrocarpa* Michx. Bur Oak, Sept. 22, 1931. Some with fruit. Species infrequent in the Park. Nos. 80 and 274.

\* Means, planted.

‡ Means, escaped from plantings, propagating spontaneously.

*Q. marilandica* Muench. Blackjack Oak, Aug. 22, 1931. In an old field above Donaldson's Cave—a single small tree. This may have been a lobed and toothed specimen of *Q. imbricaria* instead of *Q. marilandica* since no others were found. No. 100.

*Q. Muhlenbergii* Engelm. Chinquapin Oak, Aug. 19, 1931. This oak is common on upland places in the Park. No. 24.

*Quercus palustris* Muench. Pin Oak, Aug. 26, 1931. Suitable habitat for this species is infrequent in the Park. A few fine trees are to be found along the railroad north of the village. No. 139.

*Q. borealis maxima* (Marsh.) Ashe. Red Oak, Aug. 27, 1931. Common in woods. One fine tree is located immediately south of the upper Twin Cave. No. 161.

*Q. shumardii* var. *schneckii* (Britton) Sargent. Schneck Oak, Sept. 5, 1931. This oak resembles *Q. rubra* in form, while the buds are similar to *Q. palustris*, but the acorns are much too large for the latter. No. 195.

*Q. stellata* Wang. Post Oak, Aug. 25, 1931. In dry woods above Donaldson's Cave. Infrequent. No. 110.

*Q. velutina* Lam. Black Oak, Sept. 22, 1931. Common in woods and exposed places. Typical specimen with very loose and recurved scales on the cup is to be found near the road between the Cave camp ground and the Custodian's residence. Nos. 131 and 275.

*Rhamnus lanceolata* Pursh. Buckthorn, Sept. 4, 1931. Several specimens on dry hillsides overlooking the village on the west. No. 184.

*Rhus copallina* L. Dwarf Sumach, Aug. 25, 1931. Very common in old fields. No. 117.

*R. glabra* L. Smooth Sumach, Sept. 4, 1931. Old fields. No. 185.

*R. toxicodendron* L. Poison Ivy, no collection. Very common.

*Ribes cynosbati* L. Gooseberry, not collected.

\**Robinia hispida* L. Hispid Locust, Aug. 26, 1931. Planted in Hamer's Cemetery. No. 128.

*Rosa carolina* L. Pasture Rose, Aug. 25, 1931. Common in dry oak woods above Donaldson's Cave. No. 104.

*R. setigera* Michx. Prairie Rose, Sept. 4, 1931. In dry oak woods west of the village. Leaves only slightly hairy. No. 193.

*Rubus allegheniensis* Porter. Common Blackberry, Sept. 5, 1931. Common. No. 198.

*R. flagellaris* Willd. Dewberry, Sept. 4, 1931. Open woods and fields. Does not fit the description any too well, but it is definitely of prostrate habitat. No. 194.

*R. occidentalis* L. Blackcap Raspberry, Sept. 4, 1931. Common in woods and fields. No. 192.

*Salix nigra* Marsh. Black Willow, Aug. 27, 1931. Common in moist sinkholes and along creeks. No. 153.

*Sambucus canadensis* L. Elderberry, Sept. 4, 1931. Especially common in low places. No. 186.

*Sassafras variifolium* (Salisb.) Ktze, Sassafras, Aug. 19, 1931. Most common of old field species. Occasionally in forests and of several inches diameter. No. 31.

*Sp. glauca* Walt. Glaucous Greenbriar, Aug. 25, 1931. Common in woods and fields. No. 119.

\* Means, planted.

*S. hispida* Muhl. Hispid Greenbriar, Aug. 25, 1931. In dry woods. No. 120.

*S. rotundifolia* L. Roundleaf Greenbriar, Aug. 19, 1931. Common in the virgin forest and in fields. No. 95.

*Staphylea trifolia* L. Bladdernut, Aug. 20, 1931. Dry woods. No. 67.

*Symphoricarpos orbiculatus* Moench. Indian Currant, Aug. 24, 1931. Very common in old fields and open woods. No. 20.

\**Syringa vulgaris* L. Lilac, Aug. 26, 1931. Vicinity of the Donaldson's home site. No. 124.

*Tilia glabra* Vent. Basswood. No collection.

*Ulmus alata* Michx. Winged Elm, Sept. 5, 1931. Upland thicket north of route 60 and the gate house. The usual habitat southward is along streams although it seems to occupy dry hills in the northward extension of its range. This report is a new northward extension of range. No. 196.

*U. americana* L. American Elm, Sept. 4, 1931. Fine tree near the Tavern in the village. No. 187.

*U. fulva* Michx. Slippery Elm, Sept. 4, 1931. Common in woods. No. 188.

*Vaccinium vacillans* Kalm. Low Dryland Blueberry, Aug. 20, 1931. Oak woods near Donaldson's Cave and in the virgin forest. No. 53.

*Viburnum acerifolium* L. Mapleleaf Viburnum, Aug. 24, 1931. Common in the virgin forest and rich woods in general. No. 89.

*V. pubescens deamii* Rehder. Aug. 20, 1931. Frequent in rich woods in well-drained soil. No. 61.

*V. pubescens indianense* Rehder. Sept. 5, 1931. This variety can be found distinct from the preceding but intergrading plants can also be found. In woods west of Twin Caves. No. 200.

*V. rufidulum* Raf. Rusty Blackhaw, Aug. 25, 1931. Common in open woods especially on slopes and hilltops. This species is difficult to distinguish from *V. prunifolium* when the specimens have not reached the large size the former attains; in fact, the present decision rests on the fact that *V. rufidulum* is supposed to be the upland species of the hill country. No. 111.

‡*Vinca minor* L. Periwinkle, Aug. 26, 1931. This escape, in the vicinity of Donaldson's Cave is a very serious menace to the native vegetation of the otherwise rich ravines. Although the evergreen Periwinkle makes a handsome appearance the native ferns and herbs should not be sacrificed to it. No. 126.

*Vitis aestivalis* Michx. Summer Grape, Aug. 25, 1931. Open upland woods and in the virgin forest. No. 121.

*V. cordifolia* Michx. Frost Grape, Aug. 25, 1931. Open fields and fences. No. 122.

*V. vulpina* L. Riverbank Grape, Aug. 24, 1931. Upland woods although its usual habitat is near streams. No. 94.

*Xanthoxylum americanum* Mill. Prickly Ash, Aug. 20, 1931. On dry hillsides with *Celtis pumila*, *Rhamnus*, etc. The writer has seen it in similar places in Orange and Scott counties, but northward it is in moist situations, as at Wolf Lake in Lake County. No. 60.

\* Means, planted.

‡ Means, escaped from plantings, propagating spontaneously.