

AN ECOLOGICAL STUDY OF THE FLORA OF FOUNTAIN PARK AND PORTIONS OF THE ADJACENT TERRITORY, JASPER COUNTY, INDIANA.

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The writer has been interested for several years in a wooded region of 70 acres known as Fountain Park, which is located one mile north of Remington, in Carpenter Township, Jasper County, Indiana. In 1895 this land was purchased for chautauqua purposes. The accompanying map shows the parts to which references are made. The flora in section B is of little value for ecological study because the vegetation is ruined by the crowds of people who attend the chautauqua and by those having picnics in the woods. The data recorded in this paper were obtained in Sections A, C, D, E, and F.

Little has been written on the ecology and taxonomy of the native flora of Jasper County, Indiana. The vegetation of this county is largely prairie, but there are a few forest areas, this region being in the transition belt between deciduous forest and prairie. Many of these areas have been grazed and the native undergrowth has been destroyed to a great extent. Fountain Park has escaped this treatment, at least for many years, and a large number of species and varieties indigenous to this county grows here. Because of this fact, and because it seems that the flora of Fountain Park will soon pass into the control of man, and the future generations may have no exact data concerning the plants which grow here, the writer has studied this territory.

History—"The beautiful natural grove with its adjoining creek and springs which now form the grounds of Fountain Park Assembly is a historic spot. When the Indians roamed undisturbed over the prairies of the west, this grove was a stopping place on one of their three great Indian trails crossing Grand Prairie. The Shawnee and Kickapoo tribes had a village near what is now Oxford in Benton County and one of the trails leading to it crossed the Iroquois River at Rensselaer, Carpenter's Creek at Fountain Park, and Pine Creek at Nutt's Grove. In summer they enjoyed the grateful shade of the grove and in winter it gave them protection and fuel. The clear running stream ministered to their wants at all seasons. Later when the country became sparsely settled by white men the grove became a well known and much frequented resort of hunters. In 1840 the grove and creek received their present name¹ from an old hunter named Carpenter, who stopped here on a hunting trip, became very ill, and his companion left him with fuel, food and everything he could provide and went to Lafayette for a doctor. When he came back he found him dead. The weather became intensely cold and he was frozen stiff. They buried him in the grove south of the creek.² The grounds situated as they are

¹ At the time this history was written this area was known as Carpenter's Grove.

² The exact date is not known but it was about 1835.

on a direct line from Rensselaer to Lafayette became a regular stopping place for travelers making the long overland trip. In the early forties the land was entered by John Jordan and remained in possession of this family till 1888 when a bed of sand valuable in polishing glass was discovered in the grove. The land was then purchased by a glass company of Kokomo. A railroad was built from Remington to the sand bed and for a considerable time sand in large quantities was shipped to Kokomo. When this ceased to be profitable, the company took up the railroad and in 1893 sold the land to Robert Parker. Its natural advantages of location, shade, and water, together with the fact that in former years it had been used as a camping ground, suggested to him the idea of making it the location of an assembly."³ The rest of the land is now owned by John Jordan of Remington, Indiana.

Geology⁴—Jasper County lies in the valleys of the Iroquois and Kankakee rivers. Carpenter Township, in which Fountain Park is located, is in the extreme southwestern part of the county. This part of the county is a gently rolling prairie of black loamy soil. The whole county is underlaid by beds of boulder drift, which varies in depth from 20 feet in the valley of the Iroquois River, to nearly 200 feet at some of the higher levels. The highest rocks in the geological series of the county are found at Fountain Park, one mile north of Remington. They are an argillaceous sandstone, having an exposure of about 12 feet on Carpenter's Creek in the southwestern part of the Park. Stratigraphically, it is the lower division of the Waverly or Kent Sandstone; sometimes considered a member of the Devonian Age. It is better known as the subconglomerate sandstone. In former years, this stone was quarried, but it is not now being worked.

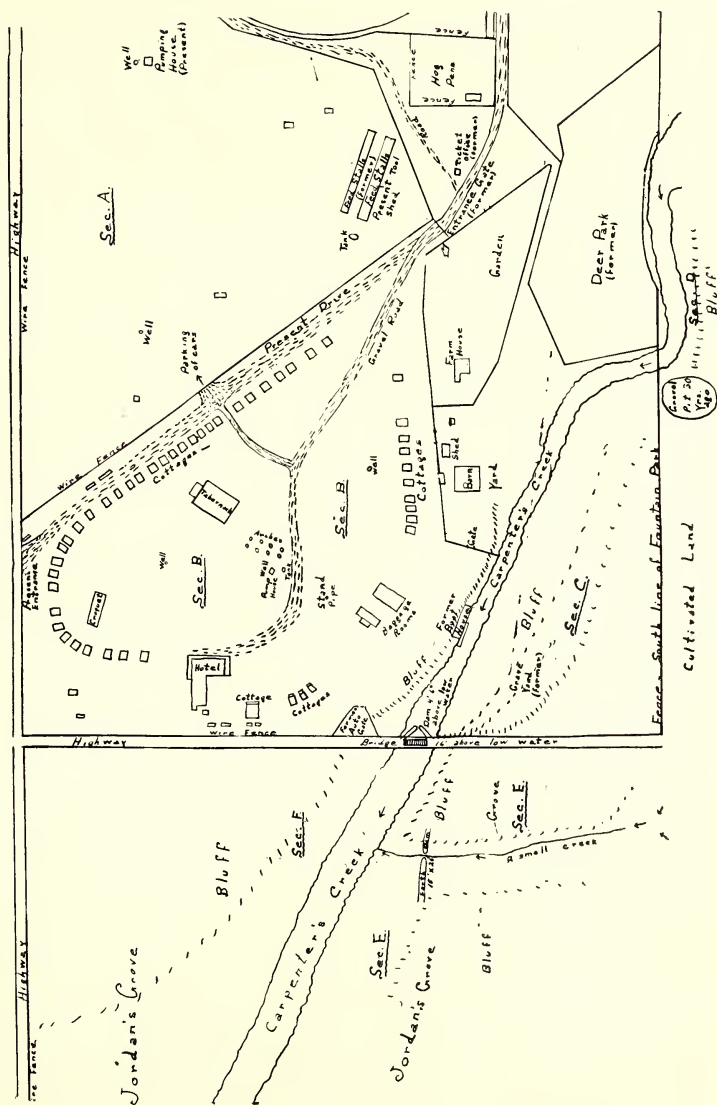
Explanation of Sections of Park. (See Figure 1.)—Section A is an open oak-hickory wood. At the present time it is used for parking cars during the chautauqua season during the latter half of August. When the Remington Fair was held in this grove the animals were kept and fed there, and many bales of hay and straw were brought for that purpose. At the present time the eastern portion of Section A is used principally for agricultural purposes. A pump house and tool shed are located on the map. The vegetation of the black loamy soil of this section is very luxuriant. There is one low place in which water stands a part of the time. This is located near the fence, a few rods southeast of the present entrance gate.

Section B has been observed but the data are not considered sufficiently valuable for reporting here in detail.

Section C includes an open oak-hickory wood on a sandstone bluff and the low ground between this bluff and the creek. The trees are young because this part was cleared of vegetation when the sandstone

³ This paragraph is copied from *The History of Fountain Park*, which is written and kept by the historian of the Fountain Park Association.

⁴ This information has been obtained from the following sources: Report of a Geological Reconnaissance of Indiana, made during the years 1859 and 1860, under the direction of D. D. Owen; Geological Survey of Indiana—Geological Reconnaissance of Jasper County by John Collett—1872; and Geology and Natural History (Twelfth Annual Report of the State Geologist of Indiana), by John Collett—1882.



Map of Fountain Park and adjacent territory
 Fig. 1—Fountain Park and adjacent territory. For full explanation see page 202.

quarry was established here, about 37 years ago. The north side of the bluff is exposed and very steep, but the northeastern part gradually slopes toward the creek. The quarry was established just east of the dam.

Section D consists of a former gravel pit and a low bluff which gradually slopes until it becomes the bank of the creek. The gravel pit has not been in use for about 30 years. It contains water some of the time.

Section E includes another bluff on the rather steep north side of which there are rocky exposures. A small ravine divides this bluff. Across the ravine an earthdam has been constructed at some time. Mr. Jordan relates that the dam was built to stop the water from going into Carpenter's Creek; thus forming a pond for fishing. The little stream has worn its way through the dam and forms a very wet place in the shade of the bluff. West of the ravine, the slope is gradual and covered with vegetation.

Section F is the northeast part of the Jordan Grove. Although the land is high near the highways, it slopes gradually into the broad bank of Carpenter's Creek.

Method—Section A was divided into 50-foot quadrats and the species in each quadrat were listed. The number of individual trees was estimated. Specific determinations were not possible in some cases.

The frequency of occurrence of each species was determined by the number of quadrats in which it was observed. Although this region has been under observation for several years, the data reported here were obtained during June and July, 1924, except that *Cardamine bulbosa* was sent to me in the spring of 1924.

In Sections C, D, E, and F, the plants were collected, identified, and habitats noted. Collections were made every week or two from June 6, 1924, to September 10, 1924. One collection was made April 19, 1924, a second July 24, 1925, and a third August 15, 1925.

Results.—There were 144 quadrats made in Section A. No efforts were made to count the species in the other sections. The order of families and the nomenclature is that of Gray's Manual, seventh edition. The following abbreviations are used: n. = north; w. = west; s. = south; e. = east; ne. = northeast; q. = quadrat; qs. = quadrats; sec. = section; and secs. = sections.

TABLE OF RESULTS.

Polypodiaceae.—*Asplenium Filix-femina*. 1 q. Wood. Sec. A. *Cystopteris fragilis*. In moss, n. side of bluff. Sec. E. *Onoclea sensibilis*. On stony bank of creek w. of bridge. Sec. E. *Woodsia obtusa*. In moss, n. side of bluff. Sec. E.

Equisetaceae.—*Equisetum arvense*. Marshy creek bank. Sec. E.

Pinaceae.—*Juniperus Virginiana*. On slope, two rods ne. of dam. Sec. B.

Najadaceae.—*Potamogeton foliosus*. Water. N. bank of creek, e. of dam. Sec. B.

Alismaceae.—*Alisma Plantago-aquatica*. Creek bank and low ground e. of dam. Sec. C. *Sagittaria latifolia*. Creek bank. Sec. F. low ground e. of dam. Sec. C.

Gramineae.—*Agrostis alba*. 13 qs. Wood. Sec. A. *A. perennans*. 5 qs. Wood. Sec. A. *Danthonia spicata*. At top of bluff. Sec. E. *Elymus striatus*. 26 qs. Wood. Sec. A. *E. virginicus*. Broad, marshy bank of creek, ne. of bluff. Sec. C. *Festuca nutans*. 13 qs. Wood. Sec. A. *Hordeum jubatum*. 1 q. Wood. Sec. A. Creek bank. Sec. C. *Hystrix patula*. 12 qs. Wood. Sec. A. *Leersia oryzoides*. Former fish pond; present stream border, s. of earth dam. Sec. E. *Panicum implicatum*. 2 qs. Wood. Sec. A. *P. latifolium*. 3 qs. Wood. Sec. A. *P. villosissimum*. 26 qs. Wood. Sec. A. *P. virgatum*. Creek bank. Sec. F. *Phleum pratense*. 2 qs. Wood. Sec. A. *Poa pratensis*. 59 qs. Wood. Sec. A.

Cyperaceae.—*Carex cephalophora*. 24 qs. Wood. Sec. A. *C. cristata*. Marshy bank of creek. Sec. C. *C. laxiflora*. Wood, on top of bluff. Sec. C. *C. vulpinoidea*. Low ground along creek. Sec. C. *Cyperus ferox*. Muddy border of old gravel pit. Sec. D. *C. filiculmis* var. *macilentus*. Sandy soil, on bluff. Sec. E. *C. rivularis*. At base of w. slope of bluff. Sec. E. *Eleocharis obtusa*. Muddy border of old gravel pit. Sec. D. *E. palustris*. Muddy border of old gravel pit. Sec. D. *Scirpus americanus*. Border of creek. Sec. C. *S. cyperinus*. In mud of old gravel pit. Sec. D. *S. Eriophorum*. Wet ground, between creek and bluff. Sec. C. *S. lineatus*. Marshy bank of creek. Sec. C. *S. validus*. Marshy bank of creek. Sec. C.

Araceae.—*Acorus Calamus*. Former fish pond; present stream border, s. of earth dam. Sec. E. Bank of creek ne. of dam. Sec. B. *Arisaema triphyllum*. 1 q. Wood. Sec. A. Shaded slope near creek. Sec. D. *Symplocarpus foetidus*. Wet, shaded ground n. of earth dam. Sec. E.

Commelinaceae.—*Tradescantia virginiana*. 39 qs. Wood. Sec. A.

Pontederiaceae.—*Pontederia cordata*. Creek bank. Sec. F.

Juncaceae.—*Juncus acuminatus*. Old gravel pit. Sec. D. *J. tenuis*. 39 qs. Wood. Sec. A. *J. Torreyi*. Border of gravel pit. Sec. D. *Luzula campestris*, var. *bulbosa*. Sandy loam of slope. Sec. F.

Liliaceae.—*Allium canadense*. 73 qs. Wood. Sec. A. *A. tricoccum*. Moist shaded slope near creek. Sec. D. *Erythronium americanum*. Sandy loam of slope. Sec. F. *Maianthemum canadense*. In moss, n. side of bluff. Sec. E. *Polygonatum biflorum*. 45 qs. Wood. Sec. A. *P. commutatum*. 20 qs. Wood. Sec. A. *Smilacina racemosa*. 24 qs. Wood. Sec. A. *S. stellata*. 9 qs. Wood. Sec. A. *Smilax herbacea*, var. *pulverulenta*. 71 qs. Wood. Sec. A. Wood. Sec. C. *Trillium recurvatum*. 16 qs. Wood. Sec. A. *T. sessile*. Moist shaded slope near creek. Sec. D. *Uvularia grandiflora*. Moist shaded slope near creek. Sec. D.

Dioscoreaceae.—*Dioscorea villosa*. 1 q. Wood. Sec. A. Wood. Sec. C.

Iridaceae.—*Iris pseudacorus*. Very wet place near creek. An escape. Sec. C. *I. versicolor*. Very wet place near creek. Sec. C.

Salicaceae.—*Salix nigra*. 1 q. Wood. Sec. A. Bank of creek. Secs. D and F. *Populus tremuloides*. Roadside s. of bridge. Sec. C.

Juglandaceae.—*Carya ovata*. 120 qs. Wood. Sec. A. Wood. Sec. C. Wood. Sec. E. *Juglans nigra*. 21 qs. Wood. Sec. A. Bank of creek. Sec. C.

Betulaceae.—*Corylus americana*. E. side of gravel pit. Sec. D.

Fagaceae.—*Quercus alba*. 132 qs. Wood. Sec. A. Wood. Secs. C and E. *Q. macrocarpa*. Thickets near creek. Sec. D. *Q. rubra*. Near n.

edge of bluff. Secs. C and E. *Q. velutina*. 75 qs. Wood. Sec. A. Wood. Secs. C and E.

Urticaceae.—*Morus alba* var. *tatarica*. Stony bank of creek. Sec. E. *Parietaria pennsylvanica*. 46 qs. Wood. Sec. A. Bluff and slopes. Secs. C and F. *Pilea pumila*. 41 qs. Wood. Sec. A. Wet shaded ground s. of bluff. Sec. E.

Polygonaceae.—*Polygonum Convolvulus*. 9 qs. Wood. Sec. A. *P. Persicaria*. 50 qs. Wood. Sec. A. Marshy bank of creek. Sec. E. *P. sagittatum*. Former fish pond, s. of earth dam. Sec. E. Creek bank. Sec. C. *P. tenue*. At top of bluff. Sec. E. *Rumex Acetosella*. 2 qs. Wood. Sec. A. Shady slope. Sec. E. *R. altissimus*. Creek bank. Sec. C. *R. crispus*. 36 qs. Wood. Sec. A. *R. obtusifolius*. 92 qs. Wood. Sec. A.

Chenopodiaceae.—*Atriplex patula* var. *littoralis*. Wood. Sec. A. *Chenopodium album*. 94 qs. Wood. Sec. A. *C. hybridum*. 6 qs. Wood. Sec. A.

Phytolaccaceae.—*Phytolacca decandra*. 27 qs. Wood. Sec. A.

Illecebraceae.—*Anychia canadensis*. 11 qs. Wood. Sec. A. Sandy slope. Sec. E.

Aizoaceae.—*Mollugo verticillata*. On bank of creek in ne. part of Sec. C.

Caryophyllaceae.—*Arenaria lateriflora*. 7 qs. Wood. Sec. A. *Cerastium vulgatum*. 4 qs. Wood. Sec. A. Sandy soil of bluffs and slopes. Secs. C and E. *Silene stellata*. 41 qs. Wood. Sec. A. Bluff. Sec. C. Bluff. Sec. E. *Stellaria longifolia*. Low, wet ground, w. of bridge. Sec. E.

Portulacaceae.—*Claytonia virginica*. 11 qs. Wood. Sec. A. Sandy loam of slope. Sec. F. *Portulaca oleracea*. Bluff. Sec. E.

Ranunculaceae.—*Anemone virginiana*. Gravel pit. Sec. D. *Anemone thalictroides*. 39 qs. Wood. Sec. A. *Aquilegia canadensis*. Wood on bluff. Sec. C. Top of bluff. Sec. E. *Ranunculus abortivus*. 12 qs. Wood. Sec. A. Shady slope, sandy loam. Sec. F. *R. fascicularis*. Slope near creek. Sec. F. *R. recurvatus*. 35 qs. Wood. Sec. A. *Thalictrum revolutum*. 17 qs. Wood. Sec. A. Edge of thicket near creek. Sec. D.

Menispermaceae.—*Menispermum canadense*. Moist shaded slope near creek. Sec. D.

Berberidaceae.—*Podophyllum peltatum*. 93 qs. Wood. Sec. A.

Papaveraceae.—*Sanguinaria canadensis*. Shaded slope near creek. Sec. D.

Fumariaceae.—*Dicentra Cucullaria*. Sandy loam, edge of wood, near creek, w. of ravine. Sec. E.

Cruciferae.—*Arabis laevigata*. 1 q. Wood. Sec. A. *Capsella Bursa-pastoris*. 1 q. Wood. Sec. A. *Cardamine bulbosa*. Wood. Sec. A. *C. pennsylvanica*. Low ground ne. of dam. Sec. B. *Dentaria laciniata*. Sandy loam of slope near creek. Sec. F. *Lepidium virginicum*. 9 qs. Wood. Sec. A. *Radicula palustris*. 2 qs. Wood. Sec. A. Wet ground s. of bluff. Sec. E. *Sisymbrium officinale*. Wood. Sec. A. *S. officinale* var. *leiocarpum*. 85 qs. Wood. Sec. A.

Crassulaceae.—*Penthorum sedoides*. Marshy bank of creek. Sec. E. Low ground. Sec. D.

Saxifragaceae.—*Heuchera hispida*. 18 qs. Wood. Sec. A. Edge of bluff. Sec. E. *Hydrangea arborescens*. Edge of bluff. Sec. E. *Ribes gracile*. 6 qs. Wood. Sec. A. Edge of bluff and in wood. Sec. C.

Hamamelidaceae.—*Hamamelis virginiana*. Edge of bluff and on slope. Sec. E.

Rosaceae.—*Agrimonia mollis*. 71 qs. Wood. Sec. A. *A. parviflora*. Along creek in e. part of Sec. C. *Amelanchier canadensis*. Edge of bluff. Sec. E. *Crataegus* sp. 2 qs. Wood. Sec. A. Thickets near creek. Sec. D. Bluff. Sec. E. *Fragaria virginiana*. 20 qs. Wood. Sec. A. *Geum canadense*. 54 qs. Wood. Sec. A. Marshy bank of creek. Sec. E. *G. virginianum*. Creek bank. Sec. C. *Potentilla canadensis*. 54 qs. Wood. Sec. A. *P. monspeliensis*. 20 qs. Wood. Sec. A. *Prunus serotina*. 77 qs. Wood. Sec. A. *Pyrus arbutifolia* var. *atropurpurea*. S. of creek. Sec. C. *P. ioensis*. 27 qs. Wood. Sec. A. *Rosa* sp. 10 qs. Wood. Sec. A. *Rubus allegheniensis*. 43 qs. Wood. Sec. A. Bluff. Sec. C. *R. hispidus*. 1 q. Wood. Sec. A. *R. occidentalis*. 14 qs. Wood. Sec. A. *R. villosus*. On slope ne. of dam. Sec. B.

Leguminosae.—*Amorpha canescens*. Bluff. Sec. C. *Amphicarpa monoica*. 77 qs. Wood. Sec. A. Bluff. Sec. C. *Cassia Chamaecrista*. 5 qs. Wood. Sec. A. *Lespedeza virginica*. Bluff. Sec. E. *Medicago lupulina*. 4 qs. Wood. Sec. A. *Melilotus alba*. 6 qs. Wood. Sec. A. *Strophostyles helvola*. Creek bank. Sec. C. *Trifolium pratense*. 12 qs. Wood. Sec. A. *T. repens*. 7 qs. Wood. Sec. A.

Oxalidaceae.—*Oxalis corniculata*. 97 qs. Wood. Sec. A.

Geraniaceae.—*Geranium maculatum*. 80 qs. Wood. Sec. A. Base of bluff. Sec. E.

Polygalaceae.—*Polygala polygama*. Sandy slope. Sec. E. *P. sanguinea*. 2 qs. Wood. Sec. A.

Euphorbiaceae.—*Acalypha virginica*. Bluff and marshy bank of creek. Sec. E.

Anacardiaceae.—*Rhus glabra*. High ground around gravel pit. Sec. D. Along creek. Sec. C. *R. Toxicodendron*. 3 qs. Wood. Sec. A.

Celastraceae.—*Celastrus scandens*. Wood. Secs. C and D.

Aceraceae.—*Acer Negundo*. Along creek. Sec. D. *A. saccharinum*. 1 q. Wood. Sec. A.

Balsaminaceae.—*Impatiens biflora*. Wet shaded ground n. of earth dam. Sec. E.

Vitaceae.—*Psedera vitacea*. 24 qs. Wood. Sec. A. Bluff. Sec. C. *Vitis vulpina*. 28 qs. Wood. Sec. A. Bluff. Sec. C.

Tiliaceae.—*Tilia americana*. 1 q. Wood. Sec. A. Low slope near creek. Sec. D.

Malvaceae.—*Abutilon Theophrasti*. Near creek. Sec. F.

Hypericaceae.—*Hypericum cistifolium*. 1 q. Wood. Sec. A. *H. gentianoides*. In gravel pit. Sec. D. *H. mutilum*. Creek bank. Sec. F.

Cistaceae.—*Helianthemum majus*. Sandy bank of gravel pit. Sec. D. Bluff. Sec. E. *Lechea tenuifolia*. Sandy bluff. Sec. E.

Violaceae.—*Viola palmata*. 7 qs. Wood. Sec. A. *V. pedata*. On bluff. Sec. E. *V. pubescens*. Shaded slope near creek. Sec. D. *V. sagittata*. 1 q. Wood. Sec. A. *V. sororia*. 90 qs. Wood. Sec. A. *V. scabriuscula*. 26 qs. Wood. Sec. A.

Onagraceae.—*Circaea lutetiana*. 119 qs. Wood. Sec. A. Bluff. Sec. C. *Epilobium coloratum*. Marshy bank of creek. Sec. E. *Ludvigia alternifolia*. At base of slope ne. of dam. Sec. B. *L. palustris*. Creek bank. Sec. F.

Araliaceae.—*Aralia nudicaulis*. In moss, n. side of bluff. Sec. E.

Umbelliferae.—*Osmorhiza longistylis*. 62 qs. Wood. Sec. A. *O. longistylis*, var. *villicaulis*. 37 qs. Wood. Sec. A. *Sanicula canadensis*. 57 qs. Wood. Sec. A. *Thaspium barbinode*. 2 qs. Wood. Sec. A. Bluff. Sec. D.

Cornaceae.—*Cornus Amomum*. 1 q. Wood. Sec. A. Foot of ne. slope near small stream. Sec. C. *Cornus asperifolia*. Along creek. Sec. D.

Ericaceae.—*Gaylussacia baccata*. Sandstone bluff. Sec. E. *Vaccinium vacillans*. Edge of bluff. Sec. E.

Primulaceae.—*Lysimachia Nummularia*. Marshy creek bank. Sec. E. *Steironema ciliatum*. Low ground near creek. Sec. C. *S. lanceolatum*. 6 qs. Wood. Sec. A.

Asclepidaceae.—*Asclepias* sp. 11 qs. Wood. Sec. A. *A. incarnata*. N. bank of creek, e. of dam. Sec. B.

Convolvulaceae.—*Convolvulus sepium*. Wood on bluff. Sec. C.

Polemoniaceae.—*Polemonium reptans*. 90 qs. Wood. Sec. A.

Hydrophyllaceae.—*Ellisia Nyctelea*. 26 qs. Wood. Sec. A. *Hydrophyllum virginianum*. Shaded slope near creek. Sec. D.

Boraginaceae.—*Lappula virginiana*. 87 qs. Wood. Sec. A. Bluff. Sec. C. Wood. Sec. D.

Verbenaceae.—*Verbena urticaefolia*. 25 qs. Wood. Sec. A. Former fish pond; present bank of stream, s. of earth dam. Sec. E.

Labiatae.—*Agastache nepetoides*. 14 qs. Wood. Sec. A. *Hedeoma pulegioides*. 106 qs. Wood. Sec. A. In moss at top of bluff and in sandy soil of bluff. Sec. E. Also Sec. C. *Leonurus Cardiac*. 53 qs. Wood. Sec. A. *Lycopus americanus*. Marshy bank of creek. Sec. E. *L. uniflorus*. Marshy bank of creek. Sec. E. *Mentha arvensis*. Stony bank of creek. Sec. E. *Nepeta Cataria*. 35 qs. Wood. Sec. A. *Prunella vulgaris*. 40 qs. Wood. Sec. A. Marshy bank of creek. Sec. E. Bluff. Sec. C. *Pycnanthemum virginianum*. 7 qs. Wood. Sec. A. *Scutellaria lateriflora*. Marshy bank of creek. Sec. E. *S. parvula*, var. *ambigua*. 1 q. Wood. Sec. A. *Stachys palustris*. 2 qs. Wood. Sec. A. Along creek. Sec. C. *Teucrium canadense*. Marshy bank of creek. Sec. E. Along creek. Sec. C.

Solanaceae.—*Solanum nigrum*. 5 qs. Wood. Sec. A. Marshy bank of creek. Sec. E.

Scrophulariaceae.—*Conoclea multifida*. Stony bank of creek. Sec. E. *Gerardia pedicularia* var. *ambigens*. Sandstone bluff. Sec. E. *G. tenuifolia*. 2 qs. Wood. Sec. A. *Gratiola virginiana*. 2 qs. Wood. Sec. A. Muddy ground at base of slope near small stream and gravel pit. Sec. C. *Mimulus ringens*. Marshy creek bank. Sec. E. *Scrophularia leporella*. 2 qs. Wood. Sec. A. Bluff. Sec. C. *S. marilandica*. Shaded slope near creek. Sec. D. *Verbascum Thapsus*. 1 q. Wood. Sec. A. Bank of gravel pit. Sec. D. *Veronica peregrina*. 1 q. Wood. Sec. A. *V. serpyllifolia*. Sandy soil of wood. Sec. E. *V. virginica*. 9 qs. Wood. Sec. A.

Bignoniaceae.—*Catalpa speciosa*. 10 qs. Wood. Sec. A.

Acanthaceae.—*Ruellia ciliosa*. Wood. Sec. D.

Phrymaceae.—*Phryma Leptostachya*. 57 qs. Wood. Sec. A. Bluff. Sec. C.

Plantaginaceae.—*Plantago Rugelii*. 65 qs. Wood. Sec. A.

Rubiaceae.—*Houstonia caerulea*. 2 qs. Wood. Sec. A. *Galium Aparine*. 3 qs. Wood. Sec. A. *G. circaezans*. 1 q. Wood. Sec. A. *G. concinnum*. 21 qs. Wood. Sec. A. Bluff. Sec. C.

Caprifoliaceae.—*Diervilla Lonicera*. Midway on n. side of bluff. Sec. E. *Lonicera Sullivantii*. 2 qs. Wood. Sec. A. Bluff. Sec. C. *Sambucus canadensis*. 39 qs. Wood. Sec. A. Along creek in e. part of Sec. C. *Triosteum perfoliatum*. 21 qs. Wood. Sec. A. Moist shaded slope. Sec. D. *Viburnum pubescens*. Thicket on slope near creek. Sec. D. *V. Lentago*. Bank of creek. Sec. C.

Cucurbitaceae.—*Echinocystis lobata*. 1 q. Wood. Sec. A. Introduced.

Campanulaceae.—*Campanula aparinoides*. Three rods ne. of dam, at base of slope. Sec. B. *Specularia perfoliata*. 9 qs. Wood. Sec. A. In moss on n. side of bluff. Sec. E.

Compositae.—*Achillea Millefolium*. 43 qs. Wood. Sec. A. *Ambrosia artemistifolia*. 66 qs. Wood. Sec. A. *A. trifida*. 10 qs. Wood. Sec. A. *Antennaria fallax*. 1 q. Wood. Sec. A. Bluff. Sec. E. *Anthemis Cotula*. 10 qs. Wood. Sec. A. *Arctium minus*. 47 qs. Wood. Sec. A. *Bidens cernua*. Former fish pond; present bank of stream. Sec. E. *B. frondosa*. Marshy creek bank. Sec. E. *Cirsium arvense*. 1 q. Wood. Sec. A. *C. lanceolatum*. Bluff. Sec. E. *Erechtites hieracifolia*. In moss on n. side of bluff. Sec. E. *Erigeron annuus*. 102 qs. Wood. Sec. A. Wood. Sec. C. *E. canadensis*. 16 qs. Wood. Sec. A. Bluff. Sec. C. *E. philadelphicus*. 20 qs. Wood. Sec. A. At base of slope Sec. B. *E. ramosus*. 102 qs. Wood. Sec. A. Wood. Sec. C. *Eupatorium perfoliatum*. Creek bank. Sec. F. *E. purpureum*. 13 qs. Wood. Sec. A. *E. urticaefolium*. Thickets near creek. Sec. D. *Helianthus annuus*. Bluff. Sec. E. Escape. *H. divaricatus*. Bluff. Secs. C and E. *H. scaberrimus*. Gravel pit. Sec. D. *Heliopsis scabra*. Bluff. Sec. C. *Hieracium scabrum*. Edge of bluff. Sec. C. *Lactuca canadensis*. 32 qs. Wood. Sec. A. Also in Sec. D. *L. villosa*. Basswood thicket. Sec. D. *Prenanthes altissima*, var. *cinnamomea*. 21 qs. Wood. Sec. A. In moss, n. side of bluff. Sec. E. *Silphium perfoliatum*. Low ground near creek. Sec. C. *Solidago caesia*. At top of bluff. Sec. E. *S. tenuifolia*. 2 qs. Wood. Sec. A. *S. ulmifolia*. 30 qs. Wood. Sec. A. Bluff. Sec. C and E. *Taraxacum officinale*. 8 qs. Wood. Sec. A. *T. erythrospermum*. In pasture near creek. Sec. F. *Xanthium canadense*. Marshy bank of creek. Sec. E.

The enumeration consists of 74 families, 188 genera, and 270 species and varieties.

Discussion. The 20 species occurring most frequently in section A. listed in the order of decreasing frequency, are: *Quercus alba*, *Carya ovata*, *Circaea lutetiana*, *Geum canadense*, *Hedeoma pulegioides*, *Erigeron annuus*, *E. ramosus*, *Oxalis corniculata*, *Chenopodium album*, *Podophyllum peltatum*, *Rumex obtusifolius*, *Viola sororia*, *Polemonium reptans*, *Lappula virginiana*, *Sisymbrium officinale*, var. *leiocarpum*, *Geranium maculatum*, *Amphicarpa monoica*, *Prunus sero-*

tina, *Quercus velutina*, and *Allium canadense*. The dominant species, those that exercise the greatest control over the environment, are therefore *Quercus alba* and *Carya ovata*, and the community may properly be called a white oak-hickory association.

There is almost a complete absence of annuals, the vegetation consisting of perennials and biennials. This explains why the parking of the cars has not ruined the vegetation in this section. The herbaceous undergrowth of the west half of section A is cut every summer before the chautauqua commences. Since seed production is not necessary for the existence of perennials, the vegetation from year to year is not affected by this treatment.

Phleum pratense and *Trifolium pratense* are used for hay by many of the farmers. The seeds are scattered by the wind, birds, and animals, including man.

Poa pratensis, *Agrostis alba*, *Hordeum jubatum*, *Juncus tenuis*, *Rumex crispus*, *R. obtusifolius*, *R. Acetosella*, *Polygonum Persicaria*, *P. Convolvulus*, *Cerastium vulgatum*, *Lepidium virginicum*, *Sisymbrium officinale*, var. *leiocarpum*, *Potentilla monspeliensis*, *Melilotus alba*, *Verbascum Thapsus*, *Arctium minus*, *Achillea Millefolium*, *Erigeron annuus*, *E. canadensis*, *E. philadelphicus*, *E. ramosus*, *Ambrosia artemisiifolia*, *A. trifida*, *Anthemis Cotula*, and *Cirsium arvense* are common in fields, meadows, roadsides, and waste grounds. From there the seeds are scattered by wind, birds, animals, and man. The seeds of the above plants may have been brought to the wood in the baled hay and straw which were used for the stock during the Remington Fair. Since the wood is rather open in many places the habitat is suitable for these plants and they are becoming established; some of them being abundant as is shown in the table of the frequency of their occurrence.

The writer has no way of knowing what the herbaceous vegetation of the wood has been in the preceding years. The early settlers tell that this region was swept by the prairie fires before it became settled by man. These fires destroyed all of the undergrowth, leaving only the large trees. Mr. Jordan, Sr. could see deer and hogs in the wood when he came there. But after the fires ceased the undergrowth developed so that one could see only short distances between the trees. Probably the vegetation is very similar to that of the days of the prairie fires, because most of the plants are perennials and the fires did not affect the subterranean parts.

Echinocystis lobata is an escape from the many plants that have been cultivated at the entrance of the Park. *Catalpa speciosa* is an escape. The seeds probably have been carried from the farm across the road by animals, man, or the wind. A possible source of these trees in section A is the row of catalpas in section B, which were planted for decorative purposes. *Tilia americana* probably came from the basswood thicket along Carpenter's Creek, which passes through the southeastern part of the Park. The seeds may have been disseminated by the wind and possibly by birds. The specimen found was a seedling. *Acer saccharinum* was observed only once. The silver maple is common as a shade tree in lawns and the seeds probably have been carried by the

wind from the farm across the road. *Cornus Amomum* is growing in the wet ground east of the entrance gate. The other forms growing here are not in an unusual habitat and therefore need no further discussion.

The number of quadrats containing arborescent seedlings are as follows: *Catalpa speciosa* 1, *Tilia americana* 1, *Quercus velutina* 2, *Q. alba* 3, *Pyrus ioensis* 17, *Juglans nigra* 21, *Carya ovata* 27, and *Prunus serotina* 42. This shows that the oak seedlings are not as tolerant of the conditions as the walnut, hickory, and cherry seedlings.

Considering the vegetation of the creek and the low region near it, the flora is typical of wet ground and moist habitats. In addition to the dissemination agents previously mentioned, water plays an important part in these sections of the territory studied.

Certain Bryophytes were observed in addition to Pteridophytes and Spermatophytes noted above. Moss is growing on the north side of the bluff and on some of the large stones near the banks of the creek. Portions of the bluff are covered with crustose lichens. *Marchantia polymorpha* is abundant on the large stones near the creek. These stones are shaded on the south by the bluff and on the east by the bridge.

It is noted that the so-called weed vegetation of the farms is not establishing itself in the moist and wet habitat as it is to a certain extent in the woods.

There is a statement in the Geological Survey report, to which an earlier reference is made, to the effect that there was an abundance of hazel and sassafras in Jordan's Grove. Mr. Jordan states that the shrubs grew after the forest fires ceased but were cut down when the grove was cleared for pasture and thereafter prevented from growing. Along the edge of the bluff a few bushes of *Hamamelis* are growing at the present time. There are some small sassafras trees near Mr. Jordan's house, but the *Corylus* has become almost extinct in the sections studied. One shrub is growing at the edge of the gravel pit. Other bushes of *Corylus* are observed on the roadsides bordering the Park. The present trees of the grove are not the original ones. The first were cut for constructing buildings and rail fences. Although the writer did not see any of the first trees, it has been learned from Mr. Jordan that there is one near his house.

Considering the arborescent species of the woods, the whole is classified as open, upland, and xerophytic. By the latter term, I mean that the woods are less mesophytic than the climax will be. The climax forest of the region, which is a beech-maple forest, is not represented in the area studied. The upland portion is more xerophytic and the habitats along the creek more hydrophytic than the climax. The presence of red oak and basswood in the oak-hickory forest shows that it is approaching the climax conditions, since these species are usually found in the climax forest and may be looked upon as forerunners of it.

Acknowledgement. To Dr. W. B. McDougall, Assistant Professor of Botany of the University of Illinois, my deep obligation is acknowledged for the guidance and assistance which he has so willingly given in the preparation of this paper. I am also greatly indebted to Mr.

Chas. C. Deam, State Forester of Indiana, for checking a large number of the specimens and offering many valuable suggestions. My sincere thanks are extended to Mr. Lewis Alter and Mr. John Jordan, Sr. for the interest they have taken in this work and for the many historic facts they have given me. The map is modified from an original one made many years ago by Mr. Alter, when he was asked to survey the Park.