

and one-half of the per cent. of sulphur. When the heating effect, as found in the calorimetre (calculated on the basis of the fuel burned and vapors of water at 100° C.) was divided by this per cent. of combustible matter it was found that one gram of combustible matter gives, on the average, for the Indiana coals 8073 calories and for the Pittsburgh coals 8078 calories.

We may, therefore, give the following empirical rule for the calculation of the heating effect of coals: *Find the combustible matter by subtracting from 100 the per cents. of water and ash and one-half of the per cent. of sulphur, and multiply this remainder by 80.7. The result will give the heating effect of the fuel burned to liquid water.*

For the twenty-one coals referred to, the heating effect calculated by this rule shows a maximum deviation from the calorimetre test of two and one-fourth per cent., while the agreement is in most cases, much closer than that.

It would not be safe to apply this rule to coals known to be of very different origin or character, until a similar comparison of calorimetre results with the analysis has been made for such coals.

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NOTES ON THE FLORA OF LAKE CICOTT AND LAKE MAXINKUCKEE. BY  
ROBERT HESSLER.

The following notes on the flora of the region surrounding Lakes Cicott and Maxinkuckee are offered as a contribution toward a complete flora of Indiana; they are based on personal observations made during the period beginning with August, 1894, and ending with December, 1896.

Longcliff, just west of Logansport, has been the basis of operation, so to speak, and this locality has been examined most fully. I thought it best, therefore, to make mention of the noteworthy plants found here, although the flora does not differ materially from that common to the central part of the State. It is the usual glacial drift flora, with beech as the most common forest tree.

The region about the lakes is in marked contrast. The upland soil is made up of a fine sand which contains only the merest trace of lime, and with oak as the prevailing tree. The lowlands in places are wet or swampy. Tamarack swamps and peat bogs occur here and there, but are nowhere of great extent. It is, perhaps, unnecessary to state that the wet northern portion of Indiana is being drained more and more every year, and the land, exceedingly fertile, brought under cultivation. The completion of the Kankakee drainage system will, in time, be followed by numerous minor systems, and in the course of a few years the

"Marsh Flora," if we may so call it, will have disappeared from Indiana. Already many of the plants, once common, are rare and restricted to isolated areas; the natural habitat being destroyed, the extermination of plants naturally follows. In my own numerous excursions I have, in many instances, been unable to find more than one or two specimens of certain species after three seasons of close search. The reports of other observers in different parts of the State show a similar result. Even now the swamps and bogs mentioned in this paper are being ditched and drained, and in a very short time the last vestiges of a once common flora will have disappeared.

The flora of the uplands, with, perhaps, a few exceptions, is in no immediate danger of extinction. It will be many years before the comparatively barren oak flats and oak ridges will be brought under cultivation, and even then species will continue to lead a more or less precarious existence in waste places and along fence rows. Species with showy flowers, or those that are useful, are among the first to disappear; this being especially true of the flora of lakes visited by summer tourists.

A few remarks on the location and general surroundings of the chief localities embraced in this paper will render unnecessary in the notes extended references to localities, which would otherwise be frequent. For instance, "Swamp east of Lake Cicott" refers to one definite locality, as described below.

LAKE CICOTT is located near the western border of Cass County, about eight miles west of Logansport. At present it is an oval body of water less than half a mile in length, east to west. Formerly it was much larger, with an irregular shore line. The north and south banks are high, even bluffy; those on the east and west low and flat. There is no outlet, but in the event of high water the excess would drain into Crooked Creek, a mile to the east. The recession of the water has been in the west, and this portion is now dry and covered by a dense growth of weeds, chiefly ragweed and smartweeds. The water is very clear and contains few aquatics. The soil of the neighborhood is sandy, a fine-grained æolian sand with little lime, and with a vegetation characteristic to such soils, chiefly oak, with an entire absence of beech. The country is gently rolling, becoming level to the west and north. The railroad station at the lake is Cicott, also spelled Ciecott.

SWAMP EAST OF LAKE CICOTT is situated about one mile due east of the lake, and marks approximately the boundary between the sandy lands on the west and the glacial drift soils on the east. At present it is reduced to a few acres, and is being rapidly encroached upon by drainage, and will soon cease to be. The number of rare species found in it is remarkable; some were seen nowhere else.

**LAKE MAXINKUCKEE.** This well-known lake, several miles in length, is located in the southwest corner of Marshall County, about thirty-five miles north of Logansport. The soil in the vicinity is sandy, especially in the uplands. The most interesting botanical localities are along the low marshy southern extremity, and, unless otherwise indicated, my references are to this part.

**TAMARACK SWAMP, SOUTH OF DELONG,** is located in the extreme northwest corner of Fulton County, within half a mile of the station on the Michigan Division of the Vandalia Railroad, and a few miles south of Lake Maxinkuckee. It has an irregular outline, is narrow in places and contains several hundred acres. In the center is the remains of an old lake, now almost covered over by a mass of ericads and peat moss. The whole region has recently been ditched, the ditch in places passing through peat four feet in thickness. This drainage is an example of what is going on all over northern Indiana.

**TAMARACK SWAMP, EAST OF MONTERAY,** is several miles west of the last named swamp, and just east of the little town of Monteray, in Pulaski County. It covers less than fifty acres, but is very dense, and also contains the remains of a lake.

**SANDY LAND, WEST OF LOGANSPORT,** is interesting, botanically. It begins abruptly at Kenneth, three miles west of Logansport, in the form of a triangle, widening from a narrow point to a mile or more, and gradually fading or disappearing at Logansport. Geologically it is a limestone ridge covered with wind-blown sand in a glacial region. At the western extremity it rises abruptly, as already indicated, and is more or less bluffly on the sides, especially on the south, fronting the Wabash River. From a height of about forty feet at the angle, it gradually declines to the east and finally merges into the ordinary 'second bottom' soil of the valley. The sandy covering, that is, the soil, is deep on the north and very thin on the south, the underlying rock being bare in places. The Western portion is covered with a thin oak wood; the remainder is in cultivation. Certain species occurring here plentifully are either absent in the other localities or occur sparingly.

**THE WABASH RIVER** at Logansport, and for many miles below, has its bed eroded in the limestone; the bluffs in places are perpendicular and often twenty-five feet high; the bottom is of solid rock, sandbars being few and small. The periodical high water washes out everything before it, and, therefore, plants usually found on the sandy banks of rivers are notably absent.

Localities other than the above are referred to by name or descriptively under the proper species. Where no locality is given the species is general.

In regard to species included and excluded, the list is limited as follows:

- (a.) To phanerogams or flowering plants.
- (b.) Plants new to Indiana, *i. e.*, plants not given in Coulter's Catalogue of the Plants of Indiana.
- (c.) Plants rare in Indiana, or locally distributed, according to the above catalogue.
- (d.) Plants noteworthy for some particular reason.
- (e.) Excluded species are those common throughout the State and which may be seen at any time. At the suggestion of Prof. Stanley Coulter, however, some species have been mentioned on account of their rarity or absence, an absence well marked to one accustomed to note the plants about him.

The nomenclature is that of the sixth edition of Gray's Manual, as at present used by the State Biological Survey. For the benefit of the reader not familiar with the botanical names the common English names have been added.

Specimens of species mentioned, unless common in other parts of the State, are in my herbarium. A set comprising those new to the State, and a number of the rarer ones, has been presented to the Biological Survey. In case of doubt as to the identity of a species, critical comparisons were made with the specimens in the herbarium of Purdue University. My thanks are due to Prof. Stanley Coulter for his kind assistance in making comparisons and in determining several species which were in leaf only.

*Anemone Pennsylvanica* L. General but nowhere abundant.

*Anemonella thalictroides* Spach. Rue Anemone. Common in sandy soils west and north, rare in drift soils.

*Thalictrum polygamum* Muhl. Tall Meadow Rue. Seen occasionally in wet soils about the lakes.

*Ranunculus multifidus*, var. *terrestris*, G. Two plants only found in a dried-up pool on the western border of Lake Maxinkuckee. None of the leaves were filiform.

*Ranunculus sceleratus* L. Cursed Crowfoot. Frequent in the brooks about Logansport; not seen at the lakes.

*Isopyrum biternatum* T. and G. Plentiful in beech woods, rare in sandy soil woods.

*Caltha palustris* L. Marsh Marigold. Frequent in wet places.

*Coptis trifolia* Salisb. Goldthread. Common in one small locality, tamarack swamp at DeLong; does not occur at Lake Cicott. No other notes.

*Caulophyllum thalictroides* Michx. Blue Cohosh. Rare in drift.

*Jeffersonia diphylla* Pers. Twin-leaf. Not seen; absent.

*Brasenia peltata* Pursh. Water-shield. Common in Lake Cicott; no notes on other localities.

*Nelumbo lutea* Pers. Water Chinquapin. Absent.

*Nymphaea reniformis* D. C. White Water Lily. Lakes, ponds and slow streams; common.

*Nuphar advena* Ait. Yellow Pond Lily. With the last, plentiful.

*Sarracenia purpurea* L. Pitcher Plant. Common in tamarack swamps around Lake Maxinkuckee. Not seen at Lake Cicott.

*Corydalis flavula* D. C. Plentiful about Logansport in all soils.

*Arabis hirsuta* Scop. Frequent along the banks of the Wabash. Plants smoothish; stems clustered. Not given in Coulter's catalogue.

*Arabis dentata* T. & G. Frequent on dry limestone cliffs and in hilly drift.

*Erysimum asperum* D. C. Western Wall Flower. Common on a few limestone cliffs west of Logansport.

*Sisymbrium canescens* Nutt. Tansy Mustard. Very common in the sandy lands west of Logansport, not seen in other localities.

*Polanisia graveolens* Raf. Noticeably absent from the banks of the Wabash River, and not seen anywhere.

*Helianthemum Conadense* Michx. Frost-weed. Frequent in dry, sandy soils about the lakes.

*Lechea major* Michx. Pinweed. Seen in two localities only, and here plentiful; one at Lake Cicott, in moist, sandy ground; the other east of Monterey.

*Lechea minor* L. A few plants seen near Lake Cicott; one locality.

*Viola pedata* L. Bird-foot Violet. Plentiful on sand ridges at Lake Cicott.

*Solea concolor* Ging. Green Violet. Rare, on limestone, west of Logansport.

*Cerastium arvense* Var. *oblongifolium* H. & B. Common in the Wabash Valley.

*Hypericum proliacum* L. Shrubby St. John's Wort. Rarely seen; east of Lake Cicott only.

*Hypericum cistifolium* Lam. In several places; wet limestone ledges on the Wabash; plentiful where it does occur.

*Geranium Carolinianum* L. A weed along the railroads.

*Xanthoxylum Americanum* Mill. Prickly Ash. Frequent in drift.

*Ilex verticillata* G. Winter Berry. Frequent about the lakes.

*Nemopanthes fascicularis* Raf. Frequent in tamarack swamps at DeLong; not seen anywhere else.

*Rhamnus lanceolata* Pursh. A few bushes on the limestone outcrops west of Logansport.

*Ceanothus Americanus* L. New Jersey Tea. Common everywhere in dry, upland, sandy soils; not seen in drift.

*Vitis Labrusca* L. Fox Grape. Rare; about the lakes.

*Negundo aceroides* M. Box Elder. In drift soils, rare.

*Rhus venenata* D. C. Poison Tree. Poisiu Dog-wood. Excessively common about DeLong in tamarack swamps and peat bogs. Not seen at Lake Cicott. Its presence in a swamp acts as an effectual barrier to the entrance of many persons, especially those readily susceptible to its noxious influence. Many persons proof against the common Poison Ivy readily succumb to this species.

*Rhus Canadensis* Marsh. Fragrant Sumach. Very common and forming thickets in the thin, sandy soils west of Logansport and in the limestone ledges. Rarely seen in other localities.

*Polygala Senega* L. Seneca Snakeroot. Common in sandy soils east of Lake Cicott; more or less general in sand soils, but nowhere common.

*Polygala sanguinea* L. Rarely seen, in moist alluvial soils at lakes.

*Polygala cruciata* L. A few plants in one locality only, a moist place south-east of Lake Cicott.

*Lupinus perennis* L. Wild Lupine. Common about the lakes.

*Psoralea onobrychis* Nutt. Rare, in sandy soils.

*Amorpha canescens* Nutt. Lead Plant. Seen occasionally at Lake Cicott. No notes on its occurrence in other localities.

*Petalostemon violaceus* M. Rare; in sandy soils.

*Petalostemon candidus* M. With the last and rare.

*Tephrosia Virginiana* Pers. Goat's Rue. Lake regions; rare.

*Astragalus Canadensis* L. Along the west shore of Lake Maxinkuckee; not rare.

*Desmodium canescens* D. C. In sandy soils.

*Lespedeza violacea* Pers. Common in sandy soils west of Logansport; also occasional in other places.

*Lespedeza reticulata* Pers. Sandy woods of lake regions; frequent.

*Lespedeza capitata* M. With the last and common.

*Lespedeza angustifolia* Ell. A single large, bushy plant was found along the railroad east of Lake Cicott; perhaps a migrant.

*Vicia Caroliniana* Walt. Sandy soils about the lakes; frequent. Several other species, belonging apparently to the *Viciee* group, were found in leaf only, and on account of their uncertain identity are here excluded.

*Apios tuberosa* M. Absent.

*Gymnocladus Canadensis* Lam. Coffeenut Tree. Seen occasionally in drift soils at Logansport: trees often large.

*Prunus Americana* Mar. Wild Plum. Rare.

*Prunus Virginiana* L. Choke Cherry. Limestone bluffs; rare.

*Spiraea salicifolia* L. Common Meadow Sweet. Common in wet situations about the lakes.

*Spiraea tomentosa* L. Hardhack. Steeple-bush. With the last, but rare.

*Spiraea lobata* Jacq. Queen of the Prairie. With the preceding.

*Physocarpus opulifolius* Maxim. Nine-bark. Rare; along Crooked Creek.

*Potentilla Norvegica* L. A weed in cultivated ground; common in drift.

*Potentilla fruticosa* L. Shrubby Cinquefoil. In a few places near the lakes, and here common.

*Pyrus arbutifolia* Var. *melanocarpa* Hook. Choke-berry. Frequent in low lands at the lakes.

*Amelanchier Canadensis* T. & G. Service-berry. Generally distributed, but rare.

*Amelanchier Canadensis* Var. *oblongifolia* T. & G. Dwarf June-berry. On limestone cliffs of the Wabash; not rare.

*Saxifraga Pennsylvanica* L. Meadow Saxifrage. Frequent in wet places.

*Parnassia Caroliniana* Michx. Abundant in many wet places.

*Ribes floridum* L'Her. Wild Black Currant. Seen occasionally in wet woods near Logansport.

*Drosera* species. Although a very close search was made for species of *Drosera*, not a single plant was found.

*Hamamelis Virginiana* L. Witch-hazel. None seen.

*Liquidambar Styraciflua* L. Sweet Gum. Seems to be absent.

*Myriophyllum*. No notes.

*Lythrum alatum* Pursh. Loosestrife. Common near the water's edge Lake Cicott; less common at Lake Maxinkuckee; moist places along the Wabash.

*Decodon verticillatus* Ell. Swamp Loosestrife. I have no specimens and no notes on its occurrence, but at this writing (December, 1896) believe it occurs in at least one wet place near Lake Cicott. I may add, parenthetically, that it occurs plentifully at Turkey Lake, in the northeast portion of Kosciusko County.

*Epilobium angustifolium* L. Great Willow Herb. A single large specimen of this handsome plant was found on the edge of the Tamarack Swamp at DeLong. Not in Coulter's Catalogue.

*Heraclern lanatum* Michx. Cow-Parasnip. Moist places about Lake Cicott; not rare.

*Eryngium yuccaeifolium* Michx. Rattlesnake Master. Frequent about the lakes, especially Lake Cicott.

*Aralia racemosa* L. Spikenard. In drift soils; rare.

*Viburnum acerifolium* L. Dockmackie. Common in sandy soils.

*Triosteum perfoliatum* L. Horse Gentian. Rare.

*Triosteum angustifolium* L. Common in sandy soils. (Besides these well-marked forms there occur, especially in the sandy soils west of Logansport, specimens that partake of the characters of both. In a large collection all stages of transition of one to the other may be seen. Are possibly hybrids.)

*Houstonia caerulea* L. Bluets. Only two plants were found, one of which was in bloom, on the grassy edge of a thin sandy woods, about one mile south of Lake Cicott. The leaves are very hairy.

*Houstonia purpurea* L. A narrow-leaved form is common in the sandy lands west of Logansport; also seen about the lakes.

*Galium boreale* L. Northern Bedstraw. Noticed in three localities. Common in the swamp east of Lake Cicott and also common on the southern edge of Lake Maxinkuckee; rare on the wet limestone ledges just west of Logansport, on the Wabash. The occurrence in Cass County greatly extends its southern range in Indiana, according to Prof. S. Coulter.

*Valeriana edulis* Nutt. Common in a wet meadow on the southeast edge of Lake Maxinkuckee and in the swamp east of Lake Cicott, seen nowhere else. This species is not reported in Coulter's Catalogue.

*Valerianeila radiata* Dufur. According to my notes, occurs along the railroad east of Cicott, but I can not vouch for its identity; no specimens preserved.

*Eupatorium sesilifolium* L. Upland Boneset. Occasional in sandy lands west of Logansport.

*Liatris scariosa* Willd. Frequent in dry sandy soil.

*Liatris spicata* Willd. Common in wet situations.

*Grindelia squarrosa* Dunal. Appearing along the railroads.

*Solidago latifolia* L. Broad-leaved Goldenrod. Rare.

*Solidago uliginosa* Nutt. Wet places.

*Solidago speciosa* Nutt. Rare; in sandy lands west of Logansport and in the neighborhood of Lake Cicott; not seen elsewhere. This showy species is not reported in Coulter's Catalogue of the Plants of Indiana.

*Solidago patula* Muhl. Common in wet places.

*Solidago rugosa* Mill. Collected at Lake Maxinkuckee in the fall of 1894. No notes.



*Solidago ulmifolia* Muhl. Common in thin woods, sandy lands west of Logansport.

*Solidago arguta* Ait. With the last, rare.

*Solidago serotina* Ait. Collected at Lake Maxinkuckee. No notes.

*Solidago nemoralis* Ait. Frequent in dry places at Lake Cicott.

*Solidago radula* Nutt. Collected at Lake Maxinkuckee.

*Solidago rigida* L. Some large plants at Cicott; frequent.

*Solidago Ridellii* Fr. Common in wet places.

*Solidago lanceolata* L. Common.

*Solidago tenuifolia* Pursh. At Lake Cicott; rare.

(Besides the above several *Solidagos* of doubtful identity were collected in different localities. Where no locality is given in the list the species occurs generally. These remarks also apply to the *Asters*. *Asters* are not represented as well as the *Solidagos*.)

*Aster Novae-Angliae* L. Common in wet places.

*Aster azureus* Lindl. Wet meadow east of Cicott.

*Aster cordifolius* L. Frequent.

*Aster laevis* L. Frequent.

*Aster umbellatus* Mill. Very tall and common in a wet place east of the Kenneth Stone Quarries, west of Logansport; rare at Lake Maxinkuckee.

*Aster inariifolius* L. Occurs sparingly on the southern high, dry, sandy bank of Lake Cicott; not found elsewhere.

*Silphium terebinthaceum* L. Frequent; open, sandy soils.

*Silphium laciniatum* L. The Rosin-weed was not seen by me, but a friend brought me some leaves from the extreme northwest corner of Cass County; is reported common on the prairies to the northwest.

*Silphium integrifolium* Michx. Frequent about Lake Cicott.

*Parthenium integrifolium* L. Very rare; a few plants south of Cicott.

*Ambrosia psilostachya* D. C. Seen in leaf only; along the Vandalia Railroad at Marmont; evidently a migrant. Not in Coulter's Catalogue.

*Echinacea purpurea* Moench. Purple Cone-Flower. Generally distributed, but not common.

*Rudbeckia subtomentosa* Pursh. About Lake Cicott; rare.

*Lepachys pinnata* T. & G. General, but rare.

*Helianthus occidentalis* Rid. In dry places, Lake Cicott; rare.

*Helianthus divaricatus* L. Sandy woods west of Logansport; rare.

*Coreopsis palmata* Nutt. High south bank, Lake Cicott; rare.

*Coreopsis tripteris* L. Sandy woods; common.

*Dysodia chrysanthemoides* Lag. Along the railroad at Cicott; evidently a migrant. Not seen elsewhere.

*Artemisia caudata* Michx. High, sandy bank, Lake Cicott; rare; a few plants only. Not seen elsewhere.

*Cacalia atriplicifolia* L. Dry, sandy soil, along the railroad, east of Lake Cicott; possibly a migrant.

*Cacalia tuberosa* Nutt. Tuberous Indian Plantain. Swamp east of Lake Cicott only, and here common.

*Cnicus arvensis* Hoffm. Canada Thistle. Noticed a small patch at Logansport by the side of the railroads; is a migrant.

*Prenanthes racemosa* Michx. East of Cicott; rare. Not in Coulter's Catalogue, but reported since then.

*Lactuca scariola* L. Prickly Lettuce. This rank weed is excessively common along the railroads, and is rapidly spreading.

*Lobelia cardinalis* L. Not seen; if present at all, is certainly rare. (Common at Turkey Lake, in Kosciusko County.)

*Lobelia spicata* Lam. Frequent in dry, sandy soils.

*Lobelia Kalmii* L. Not rare in wet places.

*Campanula rotundifolia* L. Var. *Arctica*. Harebell. Common in crevices in limestone bluffs on the Wabash; frequent on high banks of Lake Maxinkuckee. Not seen at Lake Cicott.

*Gaylussacia resinosa* T. & G. Black Huckleberry. Common in open, sandy woods about the lakes.

*Vaccinium Pennsylvanicum* Lam. Dwarf Blueberry. Seen in one locality, a thin, sandy woods south of Lake Cicott. Doubtless occurs in other localities.

*Vaccinium corymbosum* L. Common or Swamp Blueberry. Common in swamps in sandy regions; not found in drift soil.

*Vaccinium macrocarpon* Ait. Cranberry. Common in open places in the tamarack swamps and peat bogs south of Lake Maxinkuckee. Not at Lake Cicott. According to the accounts of old settlers, very large cranberry bogs existed when the country was first occupied. The bogs or marshes now existing are small and are rapidly disappearing.

*Epigaea repens* L. Arbutus. Not seen.

*Gaultheria procumbens* L. Wintergreen. Frequent in low, damp woods about the lakes.

*Andromeda polifolia* L. With the Cranberry and Pitcher-Plant, in peat bogs chiefly; common where it does occur. Not in Coulter's catalogue.

*Cassandra calyculata* Don. Leather-Leaf. With the last; common.

*Monotropa uniflora* L. Indian Pipe. Rare; east of Lake Cicott.

*Monotropa Hypopitys* L. Pine-sap. Rare; with the last.

(No other members of the Heath family were seen.)

*Dodecatheon Meadia* L. Shooting-Star. A few plants in a wet meadow east of Cicott. Not seen in other localities.

*Trientalis Americana* Pursh. Star-Flower. In tamarack swamps; common where it does occur.

*Steironema ciliatum* Raf. General, but nowhere abundant.

*Steironema longifolium* G. In swamps; common.

*Lysimachia stricta* Ait. Plentiful in a small swamp south of Lake Cicott; no notes on its occurrence elsewhere.

*Apocynum androsaemifolium* L. Spreading Dogbane. General in sandy soils, and common along the railroads.

*Apocynum cannabinum* L. Indian Hemp. Not as frequent as the last.

*Asclepias verticillata* L. About the lakes; rare.

*Acerates longifolia* Ell. On the high, sandy, south bank Lake Cicott.

*Sabbatia angularis* Pursh. This handsome plant is common on the moist, sandy shores of Lake Cicott, and was not seen in any other locality.

*Gentiana crinita* Froel. Fringed Gentian. General in wet places, but not common.

*Gentiana quinqueflora* Lam. Not seen.

*Gentiana Andrewsii* Grisb. Closed Gentian. Rare; in moist woods.

*Gentiana alba* Muhl. A single plant in seed found in the summer of 1895 east of Lake Cicott.

*Frasera Carolinensis* Walt. American Columbo. A score or so of plants occur in the dry, sandy woods west of Logansport; not seen elsewhere.

*Menyanthes trifoliata* L. Buckbean. In bogs with the Pitcher-plant and Cranberry; common here.

*Phacelia bipinnatifida* Michx. In the Wabash Valley about Logansport, on rocky and hilly places; common; very fetid.

*Phacelia Purshii* Buckley. Common in cultivated grounds at Logansport as a weed; this year it bloomed freely in the fields at Longcliff up to November 27, not having been injured by a previous temperature of 22 degrees.

*Mertensia Virginica* D. C. Virginia Cowslip, Bluebells. In two localities in the valley west of Logansport; rare.

*Lithospermum arvense* L. Wheat-thief, Corn Gromwell. A weed common along the railroads, and has taken possession of some fields.

*Lithospermum hirtum* Lehm. Common in sandy soils.

*Echium vulgare*. The Viper's Bugloss, or Blue-weed. Occurs along the B. & O. Railroad east of Turkey Lake, in Kosciusko County; it will quite likely soon appear in this region.

*Chelone glabra* L. Turtle-head. Frequent in wet places.

*Pentstemon pubescens* Sol. Common in sandy soils.

*Pentstemon lvirigatus* Sol. Rare; in drift soils about Logansport.

*Veronica Anagallis* L. Water Speedwell. Rare.

*Castilleja coccinea* Spreng. Painted Cup. About the lakes; rare.

*Pedicularis lanceolata* Michx. Occasionally seen in wet places.

*Utricularia* species. None found in flower and I have no notes on its presence in the waters of this region, although it must certainly be found. I have seen it in Carroll county on the south and in Kosciusko County to the northeast.

*Tecoma radicans* Juss. Trumpet Creeper. Along the railroads.

*Ruellia ciliosa* Pursh. In sandy soils, frequent.

*Verbena angustifolia* Michx. Common in the thin wind-blown, sandy soils, often barely covering the underlying limestone, west of Logansport; also occurs sparingly near the river. Not seen at the lakes.

*Pycnanthemum lanceolatum* Pursh. Mountain Mint. About the lakes, frequent. The bruised leaves exhale a strong odor resembling peppermint.

*Pycnanthemum linifolium* Pursh. Common in dry, sandy soils about the lakes. Scarcely odorous.

*Calamintha Nuttallii* Gray. On wet limestone ledges along the Wabash River below Logansport; here plentiful. Not seen elsewhere. Not reported in Coulter's Catalogue of the Plants of Indiana.

*Scutellaria galerioides* L. Scullcap. Frequent near water.

*Physostegia Virginiana* Benth. False Dragon Head. Frequent.

*Plantago Patagonica*. The only species of *Plantago* observed besides *P. major* and *P. lanceolata* was the above, or a variety of it. It grew near a railroad in Logansport.

*Polygonum sagittatum* L. Arrow-leaved Tear-thumb. Occasional in wet places.

*Dirca palustris* L. Leather-Wood. Common in low, moist, drift soil, woods near Logansport. I do not remember seeing it in the sandy soils at the lakes.

*Comandra umbellata* Nutt. Bastard Toad-flax. General in dry, sandy soils; common east of Lake Cicott.

*Euphorbia dentata* Michx. Abundant in one locality, at the base of a limestone bluff, west of Logansport. Not seen elsewhere.

*Ulmus fulva* Michx. Slippery Elm, Red Elm. Is a common forest tree in drift soils, often very large.

*Betula lenta* L. Cherry Birch, Sweet Birch. Occurs sparingly in the tamarack swamps at DeLong, south of Lake Maxinkuckee.

*Betula pumila* L. Low Birch. Not rare about the lakes.

No notes on *Carya*, *Quercus* or *Salix*.

*Coniferæ*. The only species seen were of *Larix* and *Juniperus*; the latter is general, but nowhere abundant. *Larix Americana* Michx. occurs plentifully in the so-called tamarack swamps, and these are being limited more and more in size and number.

ORCHIDS. A careful search was made for orchids, and the following list gives all the species found:

*Liparis loeselii* Richard. Tway-blade. A few plants on a moist hillside south of Lake Cicott. The plants were past bloom when found, and a dried specimen was compared with those in the herbarium of Purdue University.

*Spiranthes cernua* Richard. Rare; in low, moist woods south of Cicott.

*Godyera pubescens* R. Br. Rattlesnake Plantain. Rare; in woods southeast of Cicott; plants were in leaf only.

*Culopogon pulchellus* R. Br. Common in swamps about the lakes.

*Pogonia ophioglossoides* Nutt. In a peat bog at DeLong; here common.

*Habenaria bracteata* R. Br. Rein-Orchis. A group of three plants found in the thin sandy woods west of Logansport.

*Habenaria lacera* R. Br. Ragged Fringed Orchis. Two plants found in peat bog with *Pogonia*.

*Cypripedium pubescens* Willd. Large Yellow Lady's-Slipper. Rare in the woods southeast of Cicott; not seen elsewhere.

*Cypripedium spectabile* Salisb. Showy Lady's-Slipper. In the low grounds on the southern extremity of Lake Maxinkuckee; rare.

*Cypripedium acaule* Ait. Stemless Lady's-Slipper. Common in one locality, a small, dense tamarack swamp east of Monterey.

*Aletris farinosa* L. Star Grass. Very rare; in low ground on the edge of a woods south of Cicott.

*Allium cernuum* Roth. Wild Onion. Very common in many places and in all kinds of situations. Tall and showy in the wet meadows and swamps east of Lake Cicott; less showy on moist limestone ledges on the Wabash; small and stunted in crevices of dry limestone west of Logansport.

*Allium Canadense* Kalm. Wild Garlic. Lake Cicott; rare.

*Camassia Fraseri* Torr. Wild Hyacinth. In drift soils in the valley; very rare and almost extinct.

*Maianthemum Canadense* Desf. About Lake Maxinkuckee, plentiful in a few comparatively dry tamarack swamps.

*Lilium Philadelphicum* L. Wild Orange-red Lily, Wood Lily. At the lakes; seldom seen.

*Lilium Canadense* L. Wild Yellow Lily. With the last and rare.

*Medeola Virginiana* L. Not seen.

*Trillium nivale* Rid. Not seen.

*Tofieldia glutinosa* Willd. Swamp east of Lake Cicott; rare.

*Melanthium Virginicum* L. Bunch Flower. With the last; rare. The swamp about one mile east of Lake Cicott, although containing only a few acres, is remarkable for the number of rare species occurring in it. *Melanthium* and *Tofieldia* were not seen elsewhere; the former is a tall plant, not readily overlooked, while the latter is quite small.

*Tradescantia*. The form with smooth leaves, few in number, is very common in sandy soils, especially east of Lake Cicott, and blooms early in the spring. The form with hairy leaves and blooming later is rare and was seen in drift soils only.

*Peltandra undulata* Raf. A few plants on edge of tamarack swamp, east of Monteray.

*Scheuchzeria palustris* L. In one locality only, a peat bog south of DeLong; here plentiful. Not in Coulter's Catalogue.

*Potamogetons*. No notes. *P. natans* is common in the Wabash River, with a narrow-leaved form resembling *P. pauciflorus*.

*Najas*. I do not remember seeing any within the region embraced in this paper. (Have seen plants in Turkey Lake, in Kosciusko County.)

*Cyperaceae*. Not being familiar with this large order, I have not given it attention; my few notes are not worth reproducing.

*Panicum clandestinum* L. (?) Some large plants, up to four feet in height, with stinging hair, occur in a wet meadow on the edge of a thicket near the old canal, three miles west of Logansport. The specimens taken were not in bloom, and hence the doubt about their identity.

*Zizania*. Water, or Wild Rice. No notes on its occurrence; absent?

*Alopecurus geniculatus* L. *Var. aristatulus*, Torr. A few plants found on the dirt, chiefly peat, thrown out in making a ditch through the tamarack swamp south of DeLong.

*Phragmites communis* Trin. A small patch occurs near the southern end of Lake Maxinkuckee. Stalks 8 to 12 feet high.