THE PEACOCK PRAIRIE — A STUDY OF A VIRGIN ILLINOIS MESIC BLACK-SOIL PRAIRIE FORTY YEARS AFTER INITIAL STUDY

ROBERT F. BETZ and MARION H. COLE
Northeastern Illinois State College, Chicago and Deerfield, Illinois

ABSTRACT. — The Peacock Prairie is a 5½ acre tract of land in Cook County, 4 acres of which are comparatively high quality mesic black soil prairie. According to historical records and to testimony of the descendants of the Peacock family, the original owners of the property, the land has never been plowed or systematically grazed. The nature of the vegetative cover tends to support this view. Although of comparatively small size, this tract of land is probably the largest virgin *mesic black-soil* prairie extant in Illinois. The few weeds that were found on the prairie in 1926-27, resulting from light grazing, had practically disappeared by 1967. Peacock Prairie contains approximately 130 species of comparatively rare "prairie plants," including ten species of prairie legumes, two lilies, two gentians, and one orchid. In the forty-year period (1927-1967) only one species of prairie plant seemed to have disappeared; however, nineteen species, not reported in 1927, were found on the prairie in 1967. It is remarkable that with no care whatsoever (e.g. no controlled burning or mowing) the prairie has resisted the invasion of both weeds and woody plants; consequently, it offers a norm or standard of comparison for future studies of prairie and prairie restoration.

There have been surprisingly few studies made of Illinois prairies. Gleason (1910) studied the sand prairies of the inland sand deposits, and Gates (1912) the sand prairies of the beach area in northeastern Illinois. Evers (1955) studied the hill prairies along the Illinois River and Fell & Fell (1956) examined those along the Rock River; yet with the exception of the studies of Vestal (1914) and Sampson (1921), there have been no studies of the virgin Illinois black-soil prairies, which at one time represented the major portion of the vegetation of northern and central Illinois. The survival of a virgin black-soil prairie in Illinois is extremely fortuitous because most of them have been practically destroyed through overgrazing and cultivation during the past 150 years of settlement.

In 1929, Paintin published a paper about a small prairie in northeastern Illinois which occupied a tract of land that was part of the Peacock estate and which was (and still is) known as the Peacock Prairie. It is located on the southwest outskirts of Glenview in Cook County and is a virgin black-soil prairie which contains patches of low prairie. At the time of the initial study (1926-27) the prairie was approximately ten acres, but during the intervening years the eastern part has been destroyed for a housing development;

today the prairie is about 5½ acres, 4 of which are high quality virgin prairie. In Paintin's paper the prairie was described, the plants found on it were recorded, and an effort was made to quantify the collected data.

Forty years have elapsed since the original study was made, and it would seem timely to make a comparative study to determine what changes, if any, have occurred during this period.

Topography and Composition of the Prairie

Mr. Warren Long, a direct descendant (fifth generation) of the original owner, has stated that as far as he knows, the land (Peacock Prairie) has never been broken, fenced, or grazed. He further notes that it was traversed by a wagon exit from the farm, which lay to the east, onto Milwaukee Avenue (Indian Trail Road) at one time. The prairie is located on Tinley ground moraine. The soil is developed on calcareous silty clay till and borings made at the site show the leached, or "A" zone, to extend to a depth of approximately 20 inches. The upper 15 inches is black, organic rich, soil.

The prairie's original topographic surface is still evident with a low swale containing typically low prairie vegetation in the western section and with moderately higher knolls covered with upland or mesic prairie vegetation elsewhere. Upland prairie grasses, such as *Stipa spartea, Sorghastrum nutans, Andropogon gerardii, Andropogon scoparius* and *Panicum virgatum*, and those of the lowland, such as *Calamagrostis canadensis* and *Spartina pectinata*, produce a short thick sward about 2-3 feet high. Many of these grasses produce relatively few flowering culms in this dense prairie sward. Similarly, many of the late blooming composites, such as *Liatris* sp. flower sparsely under these conditions.

The 129 species of native prairie plants and 21 species of weeds that have been found and recorded for the Peacock Prairie and listed in Table 1 together with a comparison of their relative frequencies in 1927 and 1967. Among the 129 species of native prairie plants, 19 of them were not reported by Paintin in 1927. They are:

- Andropogon scoparius (little bluestem)
- Asclepias incarnata (swamp milkweed)
- Asclepias tuberosa (butterfly weed)
- Desmodium illinoense (Illinois tick trefoil)
- Galium boreale (Northern bedstraw)
- Gentiana andrewsii (closed gentian)
- Gerardia tenuifolia (purple false foxglove)
- Hypericum canadense (Canadian St. John's wort)
- Juncus acuminatus (sharp-fruited rush)
- Juncus tenuis (roadside rush)
- Lathyrus palustris (marsh vetchling)
- Lespedeza capitata (round-headed bush clover)

Table 1. — Changes in the Vascular Plants of the Peacock Prairie during the Period 1927-1967.

Since the terms "abundant", "frequent", "infrequent", and "local" were used in describing the relative frequencies of the plants found on the prairie in 1927, the same terms and, in addition, the term "rare" are used in this paper to describe the relative frequencies of the plants. Paintin did not give meanings of these terms in her paper, hence, it is not known whether they have the same approximate meanings as are intended by the present authors. In this paper the terms are used to indicate the relative frequencies of each species in the Peacock Prairie based on their individual patterns of occurrence as observed in the midwestern prairies studies by the authors. For example, in an acre of prairie, 25 plants of big bluestem grass (*Andropogon gerardii*) would be considered "infrequent" while to find 25 plants of the prairie lily (*Lilium philadelphicum* var. *andinum*) in an acre would be "common". The same number of Mead's milkweed (*Asclepias meadii*) would certainly be "abundant" for that species. Since each species is characterized by unique habits of growth, there is no valid way of comparing them all on a single absolute numerical scale.

Nomenclature for this paper is in accordance with Gray's Manual of Botany, 8th Edition, except for occasional alteration of single "i" endings to double "i" endings as recommended by the current rules of nomenclature.

TABLE 1.

Prairie Plants	1927	1967
Agrostis alba (w)	frequent	frequent, local
Agrostis hyemalis (w)	abundant	infrequent, local
Allium canadense (w)	abundant	infrequent
Allium cernuum	frequent	frequent
Amorpha canescens	infrequent	frequent
Andropogon gerardii	frequent	frequent
Andropogon scoparius (d)	.....	frequent
Anemone cylindrica	infrequent	infrequent
Antennaria neglecta	abundant	infrequent, local
Apocynum cannabinum	frequent	frequent
Asclepias incarnata (w)	.....	frequent, local
Asclepias sullivantii (w)	frequent	frequent
Asclepias tuberosa	.....	infrequent
Aster azureus	infrequent	rare
Aster ericoides	frequent	frequent
Aster laevis	frequent	abundant
Aster novae-angliae	infrequent	infrequent
Aster ptarmicoides (d)	infrequent	infrequent
Aster simplex (w)	abundant, local	infrequent, local
Baptisia leucantha	infrequent	infrequent
Baptisia leucophaea	frequent	frequent
Bidens frondosa (w)	frequent	frequent, local
Bromus kalmii	infrequent	frequent
Cacalia tuberosa	infrequent	infrequent
Carex buxbaumii (w)	infrequent, local	infrequent, local
Carex crawei (w)	infrequent, local	infrequent, local
Carex vulpinoidea (w)	infrequent, local	infrequent, local
Calamagrostis canadensis (w)	frequent	abundant, local
Cicuta maculata (w)	infrequent	infrequent
Cirsium hillii	frequent	infrequent
Comandra richardsiana	abundant	abundant
Coreopsis palmata	abundant	abundant
Desmodium illinoense (d)	.....	rare
Dodecatheon meadia	infrequent	frequent
Eleocharis palustris (w)	abundant	infrequent, local
Elymus canadensis	infrequent	infrequent
Equisetum arvense	frequent	rare, local
Eryngium yuccifolium	frequent	frequent
Fragaria virginiana	frequent	frequent
Galium obtusum (w)	infrequent	frequent
Galium boreale	.....	infrequent
Gentiana andrewsii (w)	.....	frequent
Gentiana puberula	frequent	frequent
Gerardia aspera	rare, 2 plants	.....
Gerardia tenuifolia	.....	infrequent, local

w—wet
d—dry

TABLE 1.—Continued.

Prairie Plants	1927	1967
Geum triflorum (d)	rare	infrequent
Glyceria striata (w)	frequent	infrequent
Helianthus grosseserratus	abundant	infrequent
Helianthus laetiflorus v. rigidus	abundant	frequent
Heuchera richardsonii	frequent	frequent
Hypericum canadense (w)	.....	rare, 1 plant
Hypoxis hirsuta	abundant	frequent
Juncus acuminatus (w)	.....	infrequent, local
Juncus balticus v. littoralis (w)	abundant	infrequent, local
Juncus dudleyi (w)	frequent	infrequent, local
Juncus tenuis	.....	infrequent, local
Juncus torreyi (w)	infrequent	infrequent, local
Koeleria cristata (d)	infrequent	frequent
Krigia biflora (w)	frequent	frequent
Kuhnia eupatorioides (d)	infrequent	rare
Lathyrus palustris	.....	infrequent
Lactuca canadensis	frequent	rare
Lespedeza capitata (d)	.....	infrequent
Liatris aspera	frequent	frequent
Liatris spicata	infrequent	frequent
Lilium michiganense (w)	infrequent	infrequent
Lilium philadelphicum v. andinum	infrequent	infrequent
Lithospermum canescens	frequent	frequent
Lobelia spicata	frequent	frequent
Ludwigia polycarpa (w)	abundant, local	infrequent, local
Lycopus americana (w)	frequent	frequent, local
Lysimachia ciliata (w)	frequent, local	infrequent, local
Lysimachia quadriflora (w)	abundant	infrequent
Lythrum alatum (w)	abundant	frequent
Monarda fistulosa	.....	frequent
Oxalis stricta	rare	rare
Oxalis violacea	frequent	frequent
Oxypolis rigidior (w)	infrequent	infrequent
Panicum lanuginosum (w)	infrequent	infrequent, local
Panicum leibergii	infrequent	frequent
Panicum virgatum	frequent	frequent
Parthenium integrifolium	infrequent	frequent
Pedicularis canadensis	frequent	frequent
Penthorum sedoides (w)	frequent, local	rare, local
Petalostemum candidum	frequent	abundant
Petalostemum purpureum	frequent	abundant
Phlox glaberrima (w)	abundant	frequent
Phlox pilosa	frequent	frequent
Polygala senega	frequent	frequent, local
Polygonum amphibium v. stipulaceum (w)	abundant, local	frequent, local

w—wet
d—dry

TABLE 1. — Continued.

Prairie Plants	1927	1967
Potentilla arguta	infrequent	infrequent
Potentilla simplex	abundant	infrequent, local
Prenanthes aspera	frequent	infrequent
Prenanthes racemosa (w)	infrequent	infrequent
Prunella vulgaris v. lanceolata (w)	infrequent	infrequent, local
Pycnanthemum virginianum (w)	abundant	frequent
Rosa carolina	frequent	frequent
Ratibida pinnata	frequent	infrequent
Rudbeckia hirta	abundant	infrequent
Scirpus lineatus (w)	.....	infrequent, local
Scutellaria parvula v. leonardii	.....	infrequent
Senecio pauperculus v. balsamitae	abundant	frequent, local
Sphenopholis obtusata (w)	.....	infrequent
Silphium integrifolium	abundant	frequent
Silphium laciniatum	frequent	frequent
Silphium terebinthinaceum	frequent	frequent
Sisyrinchium albidum	abundant	frequent
Smilacina stellata	abundant	frequent
Solidago altissima (canadensis)	infrequent	infrequent, local
Solidago graminifolia (w)	infrequent	infrequent
Solidago nemoralis	frequent	frequent
Solidago riddellii (w)	abundant	frequent
Solidago rigida	frequent	frequent
Sorghastrum nutans	frequent	abundant
Spartina pectinata (w)	abundant	frequent, local
Spiranthes cernua	rare, 2 plants	rare, 1 plant
Sporobolus heterolepis	.....	frequent
Stachys palustris (w)	abundant, local	infrequent, local
Stipa spartea	frequent	abundant
Thalictrum dasycarpum (w)	.....	rare
Tradescantia ohioensis	infrequent	infrequent
Typha latifolia (w)	infrequent	infrequent, local
Valeriana ciliata (w)	.....	rare
Verbena hastata (w)	infrequent	rare
Veronicastrum virginicum	abundant	infrequent
Vicia americana	frequent	infrequent
Viola papilionacea	abundant	frequent
Viola pedatifida	abundant	frequent
Zizia aurea (w)	frequent	frequent

Monarda fistulosa (wild bergamot)
Scirpus lineatus (red bulrush)
Scutellaria parvula v. leonardii (small skullcap)
Sphenopholis obtusata (wedge grass)
Sporobolus heterolepis (Northern dropseed)
Thalictrum dasycarpum (meadow rue)
Valeriana ciliata (valerian)

It is remarkable that the very characteristic and conspicuous prairie grasses, *Andropogon scoparius* and *Sporobolus heterolepis*, were not observed by Paintin in 1927.

TABLE 1.—Concluded.

Prairie Plants	1927	1967
Eurasian Weeds		
Achillea millefolium	frequent	infrequent, local
Asparagus officinalis	infrequent, edge	.....
Chrysanthemum leucanthemum v. pinnatifidum	abundant, edge	.....
Cirsium arvense	infrequent, edge	.....
Festuca elatior	rare	.....
Medicago sativa	rare, local	.....
Melilotus alba	infrequent	rare
Phleum pratense	infrequent, local	.....
Poa compressa	infrequent	rare, local
Poa pratensis	infrequent	infrequent, local
Rumex crispus	rare, edge	.....
Taraxacum officinale	infrequent	.....
Tragopogon pratensis	rare	.....
Trifolium hybridum	frequent	.....
Trifolium pratense	frequent	.....
Native Weeds		
Ambrosia artemisiifolia	infrequent	rare, local
Erigeron strigosus	infrequent, edge	rare
Hordeum jubatum (west)	infrequent, edge	.....
Oenothera biennis	infrequent	.....
Plantago rugelii	rare	.....
Xanthium pennsylvanicum	infrequent	.....

Seventeen species of plants which were reported by Paintin but not found in 1967 are listed below. Several of these species are far from their natural range in the Chicago area. The authors have indicated in parentheses species which may have been misidentified by Paintin.

Aster commutatus (Aster ericoides?)
Aster oblongifolius
Galium tinctorium (Galium obtusum?)
Gerardia aspera
Gentiana affinis (Gentiana puberula?)
Lactuca campestris (Lactuca canadensis?)
Lactuca hirsuta (Lactuca canadensis?)
Liatris graminifolia (Liatris spicata?)
Oxalis cymosa (Oxalis stricta?)
Petalostemum tenuifolium (Petalostemum purpureum?)
Pycnanthemum pilosum (Pycnanthemum virginianum?)
Rosa humilis (Rosa carolina)
Rosa woodsii (Rosa carolina)
Senecio plattensis (Senecio pauperculus?)
Sisyrinchium campestre (Sisyrinchium albidum?)
Viola cucullata (Viola papilionacea?)
Xanthium commune (Xanthium pensylvanicum?)

The following three species are identified by Paintin to genus, but not to species:

Aster sp. (white) (Aster simplex?)
Equisetum sp. (Equisetum arvense?)
Viola sp.

Many of the species of low prairie, such as, *Ludwigia polycarpa* and *Penthorum sedoides*, are less common today than in 1927, undoubtedly due to a lowering of the water table brought about by changes in drainage. Mr. Long stated that in former days (1910) the prairie was much wetter than it is today.

Most of the weeds recorded in 1927

seem to have disappeared from the prairie proper by 1967. Only 6 of the 21 species of weeds reported in 1927 were still to be found on the prairie. They are either rare or infrequent. It is possible that they may owe their continued presence on the prairie today to slight disturbances caused by man.

In an effort to give some quantitative estimation of the rich vegetative cover, 5 one-meter quadrats at random locations were staked and the non-gramineous vascular plants counted. In addition, the total number of grass shoots (tillers) were counted in a one-decimeter quadrat. These quadrat studies are listed in Table II.

With the exception of a low swale covered with *Calamagrostis canadensis* (blue joint grass), most quadrats contained from 18 to 24 different species of plants. In addition, most of the quadrats exhibited dense growth of the prairie grasses, including the rare *Panicum leibergii*, which is probably more indicative of a high-quality black-soil prairie than is *Andropogon gerardii* (big bluestem).

TABLE 2.—Counts of Vascular Plants in Various Quadrats on the Peacock Prairie.

Quadrat #1
(1 meter square)—N. W. Cent.

5 Amorpha canescens
10 Aster ericoides
14 Aster laevis
43 Coreopsis palmata
1 Cornus racemosa (seedling)
1 Lithospermum canescens
20 Panicum leibergii
2 Panicum virgatum
4 Parthenium integrifolium
1 Petalostemum candidum
8 Petalostemum purpureum
2 Ratibida pinnata
1 Rosa carolina
1 Silphium terebinthinaceum
Spartina pectinata
1 Viola pedatifida

Quadrat #3
(1 meter square)—East. Cent.

3 Allium cernuum
51 Andropogon scoparius
1 Aster ericoides
24 Aster laevis
8 Comandra richardsiana
26 Coreopsis palmata
3 Eryngium yuccifolium
10 Gentiana puberula
5 Koeleria cristata
10 Liatris aspera
4 Lithospermum canescens
3 Lobelia spicata
11 Panicum leibergii
3 Parthenium integrifolium
17 Petalostemum purpureum
2 Psoralea tenuiflora
3 Ratibida pinnata
1 Silphium integrifolium
1 Silphium terebinthinaceum
Sporobolus heterolepis
Sorghastrum nutans
1 Viola papilionacea
1 Viola pedatifida
13 Zizia aurea

Quadrat #2
(1 meter square)—West Cent.

3 Allium cernuum
1 Apocynum cannabinum
7 Aster laevis
1 Eleocharis palustris
18 Fragaria virginiana
Glyceria striata
1 Lithospermum canescens
2 Liatris aspera
10 Lysimachia quadriflora
38 Panicum leibergii
6 Pedicularis canadensis
2 Phlox glaberrima
1 Polygala senega
5 Ratibida pinnata
7 Silphium terebinthinaceum
6 Smilacina stellata
6 Solidago riddellii
1 Solidago rigida
Spartina pectinata
1 Viola papilionacea

Quadrat #4
(1 meter square)—N. E. Cent.

28 Allium cernuum
1 Amorpha canescens
1 Aster laevis
1 Baptisia leucophaea
24 Coreopsis palmata
1 Eryngium yuccifolium
16 Gentiana puberula
15 Liatris aspera
3 Lithospermum canescens
7 Panicum leibergii
3 Petalostemum purpureum
17 Psoralea tenuifolia
3 Silphium terebinthinaceum
Spartina pectinata
Sorghastrum nutans
Sporobolus heterolepis
4 Rosa carolina
1 Valeriana ciliata

TABLE 2. — Concluded.

Quadrat #5 (*1 meter square*)—*North Cent.*	*Quadrat #6* (*1 decimeter square*)
2 Allium cernuum	
1 Aster ericoides	
6 Aster laevis	
17 Comandra richardsiana	18 Calamagrostis canadensis
16 Coreopsis palmata	54 Koeleria cristata
1 Dodecatheon meadia	52 Panicum leibergii
7 Fragaria virginiana	40 Panicum virgatum
3 Hypoxis hirsuta	38 Sorghastrum nutans
2 Liatris spicata	18 Spartina pectinata
2 Lithospermum canescens	
2 Pedicularis canadensis	
13 Petalostemum candidum	
83 Petalostemum purpureum	
6 Phlox pilosa	
1 Senecio pauperculus v. balsamitae	
2 Sisyrinchium albidum	
Sorghastrum nutans	
2 Zizia aurea	

DISCUSSION

A comparison of the Peacock Prairie with the now destroyed prairie near Elmhurst, Illinois, described by Vestal in 1914, shows that the Peacock Prairie equals or even surpasses the former Elmhurst prairie in richness. It is interesting to note that Weaver (1954) referred to the Elmhurst prairie as "an example of perhaps the most luxuriant type of true prairie".

The presence of the following ten characteristic prairie legumes attests to the richness of the Peacock Prairie:

Amorpha canescens (lead plant)
Baptisia leucantha (white wild indigo)
Baptisia leucophaea (cream wild indigo)
Desmodium illinoense (Illinois tick trefoil)
Lathyrus palustris (marsh vetchling)
Lespedeza capitata (round-headed bush clover)
Petalostemum candidum (white prairie clover)
Petalostemum purpureum (purple prairie clover)
Psoralea tenuiflora (scurfy pea)
Vicia americana (American vetch)

Its richness can also be seen in the presence of two lilies: *Lilium michiganense* (Turk's cap lily) and *Lilium philadelphicum* v. *andinum* (prairie lily); two gentians: *Gentiana andrewsii* (bottle gentian) and *Gentiana puberula* (prairie gentian); and one orchid: *Spiranthes cernua* (ladies' tresses). The Peacock Prairie is the only Cook County station where *Geum triflorum* (prairie smoke) has been reported recently, and it may be the eastern-most station for this plant. It is one of the few prairies in the region that does not contain the ubiquitous *Poa pratensis* (Kentucky blue grass) and *Poa compressa* (Canada blue grass).

While the Peacock Prairie is amazingly rich for its small size, there are a number of prairie species which are found within a twenty-five mile radius

of the prairie but which are not found on it. They include:

Asclepias meadii (Mead's milkweed)
Asclepias viridiflora (green milkweed)
Carex bicknellii (Bicknell's sedge)
Castilleja coccinea (Indian paintbrush)
Ceanothus americanus (New Jersey tea)
Desmodium canadense (showy tick trefoil)
Echinacea pallida (purple cone flower)
Euphorbia corollata (flowering spurge)
Helianthus occidentalis (Western sunflower)
Lespedeza leptostachya (prairie bush clover)
Panicum oligosanthes v. scribnerianum (few-flowered panic grass)
Physostegia virginiana (false dragonhead)
Polygala incarnata (pink milkwort)
Polytaenia nuttallii (prairie parsley)
Rudbeckia subtomentosa (fragrant coneflower)
Salix humilis (prairie willow)
Solidago missouriensis (prairie goldenrod)
Zizia aptera (heart-leaved meadow parsnip)

The lack of the usually common *Euphorbia corollata* on the Peacock Prairie is interesting. This species is found on comparatively rich sand prairies, and its presence in other mesic black-soil prairies may be only due to disturbance. At the same time the high quality of the Peacock prairie is shown by the great variability and lack of uniformity in the vegetative cover. The lack of dominance of any one species, including *Andropogon gerardii* (big bluestem grass), may be an indicator of prolonged virgin conditions.

With little or no management (e.g., fencing, controlled burning, protection from rubbish, vandals) this prairie has been able to maintain itself in comparatively fine condition. Approximately 6 woody plant specimens (all less than two feet high) have established themselves on the prairie. These woody plants belonged to the following species:

Cornus racemosa (gray dogwood)
Populus deltoides (cottonwood poplar)
Prunus serotina (wild black cherry)
Rhamnus cathartica (European buckthorn)
Ulmus americana (American elm)

It is also remarkable that this prairie has been able to repel the invasion of non-prairie plants inasmuch as it is continually being inundated with weed seeds from plants along its edges as well as from the host of exotic trees and shrubs in the surrounding neighborhood.

Apparently some minor disturbance of the prairie may have taken place prior to 1927. The fact that *Achillea millefolium* (yarrow), *Poa pratensis* (Kentucky blue grass), *Antennaria neglecta* (pussy toes) and *Potentilla simplex* (common cinquefoil), which are now either rare or infrequent on this prairie, but which were common and even abundant in some portions of the prairie in 1927 would tend to substantiate this. The minor disturbance could have been due to such factors as trampling by man and by animals, wagon trails, light grazing, and digging prairie

plants for gardens; however, in 1967, there was little evidence of such a disturbance.

At present a number of organizations and individuals are joined together in an effort to preserve the Peacock Prairie for future scientific and educational use. With the almost complete destruction of the eastern tall-grass prairies, the Peacock Prairie should be preserved as a standard for comparison in future ecological work on Illinois prairies.

Acknowledgments

Sincere thanks are expressed to Mr. Floyd Swink, Taxonomist, The Morton Arboretum, Lisle, Illinois, for help in identifying some of the specimens, and to Dr. Paul Kilburn, Principia College, Elsah, Illinois, for aid in setting precise quadrat methods.

Literature Cited

Evers, R. A. 1955. Hill Prairies of Illinois. Bull. Ill. Nat. Hist. Surv. *26* (5):368-444.

Fell, Egbert W. and George B. Fell. 1956. The Gravel-Hill Prairies of Rock River Valley in Illinois. Ill. Acad. Sci. Trans. *49*:47-62.

Fernald, Merritt L. 1950. Gray's Manual of Botany, Eighth Edition. American Book Company, New York, N.Y.

Gates, Frank C. 1912. The Vegetation of the Beach Area in Northeastern Illinois and Southeastern Wisconsin. Bull. Ill. State Lab. Nat. Hist. *9* (5): 372.

Gleason, Henry A. 1910. The Vegetation of the Inland Sand Deposits of Illinois. Bull. Ill. State Lab. Nat. Hist. *9* (3):1-174.

Paintin, Ruth Davis. 1929. The Morphology and Nature of a Prairie in Cook County, Illinois. Ill. Acad. Sci. Trans. *21*:152-175.

Sampson, H. S. 1921. An Ecological Survey of the Prairie Vegetation of Illinois. Ill. Nat. Hist. Surv. *13*:523-577.

Vestal, Arthur G. 1914. A Black-Soil Prairie Station in Northeastern Illinois. Bull. Torrey Bot. Club *41*:351-363.

Weaver, J. E. 1954. North American Prairie. p. 180-181. Johnsen Publishing Company, Lincoln, Nebraska.

Manuscript received April 22, 1968.