

THE FLORA OF SPENCER COUNTY
(T4S-R4W SECTION 12)

A Thesis
Submitted to the Faculty
Of Saint Meinrad College of Liberal Arts
In Partial Fulfillment of the Requirements
For the Degree of Bachelor of Science

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INTRODUCTION

Taxonomy, the science of plant identification, has served man throughout history. At first, plant identification, in its most primitive form, enabled man to survive by the selection of edible foods, which in turn as culture developed, also provided the basis for agriculture. Each period of cultural development added to man's knowledge of plants and their identification.

The Greek, Theophrastus (c. 300 B.C.), developed a system of plant identification grouping plants into useful categories, such as, woody or herbaceous, which later would provide some of the frame-work for modern plant classification. The Roman author, Pliny the Elder, wrote on medical botany (c. 77 A.D.), giving the rudiments of identifying and using plants for medicine.

Men like Linnaeus (1753), the founder of modern plant classification, Engler and Prantl (1887-99), who developed and showed the relationship of plants to each other, advanced our understanding and ability to identify plants for scientific, medical, and agricultural purposes.

In our own day, Charles Deam (1940), began the work of collecting and identifying the Flora of Indiana. His work

provided the basis for the Indiana Herbarium and all subsequent endeavors in the field of Indiana plant identification.

During the 30 years since the publication of Deam's The Flora of Indiana, only minor additions have been made to Deam's list of approximately 635 species found in Spencer County, Indiana. These additions were made primarily by the Biology Department of St. Meinrad College. Betz (1961), a student of St. Meinrad, wrote his Bachelor of Science thesis on the collection and identification of plants collected within the County. This thesis listed a total of 76 species, 40 of which were new species for Spencer County. The listing was for Spring Flora only.

Spencer County, Indiana, is located within the Eastern deciduous forest region of the United States and is composed primarily of hardwood stands of Oak-Hickory with scattered secondary stands of Beech-Maple. The County comprises part of the unglaciated area of Indiana and has heavy outcroppings of sandstone and limestone. The soil of the area tends to be sandy loam to clay loam. Spencer County climatic factors are widely variable with average temperature extremes of 8° F in the winter to 96° F in summer. Seasonal rainfall averages between 40 to 50 inches, mostly during Spring and late Fall.

Because of the collecting time and the size of Spencer

County, it was decided that only "wild flowers" and "ferns" would be collected from a single section. No trees, shrubs, mosses, fungi, algae, grasses or sedges were collected. T4S-R4W Section 12, St. Meinrad Quadrangle was selected (Figure 1), because it contained within its borders many variables typical of Spencer County as a whole.

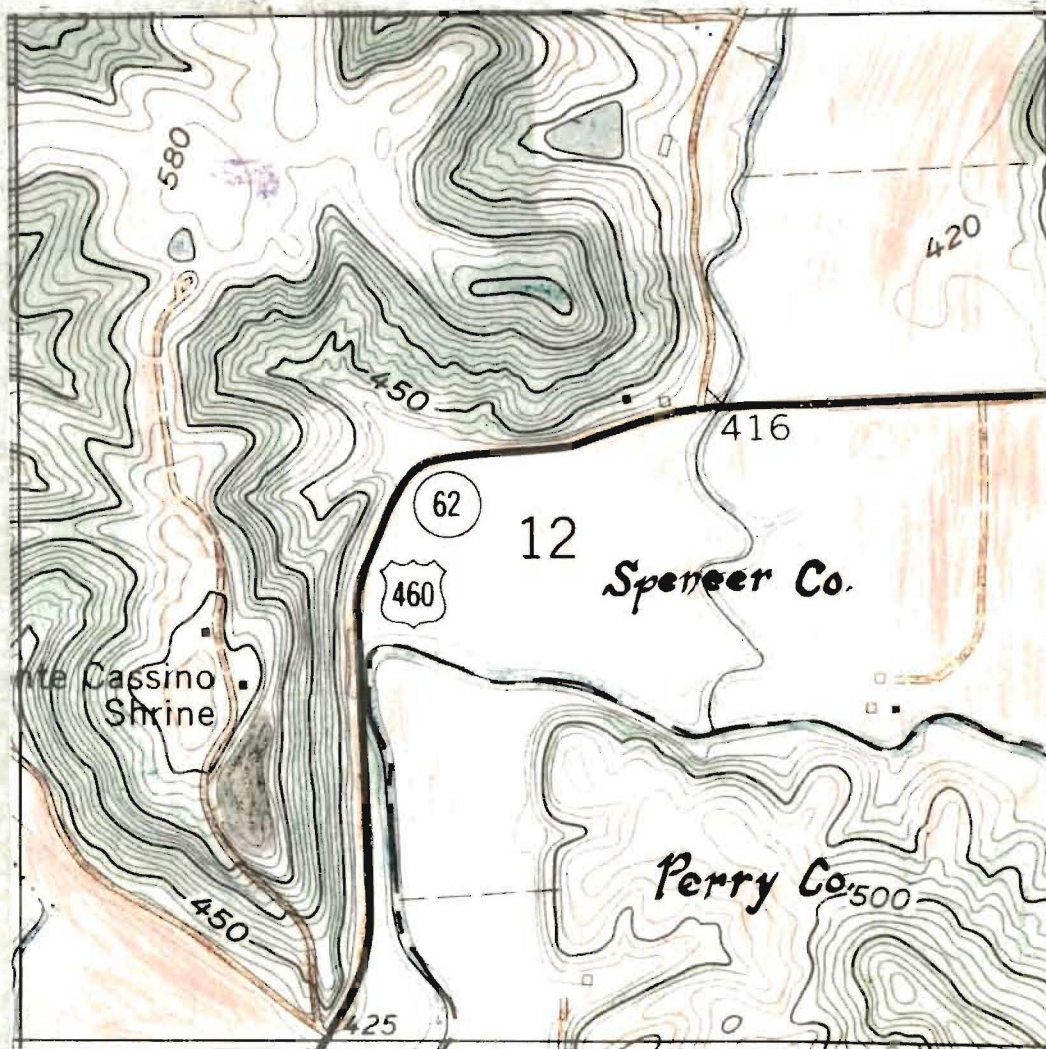


Figure 1. Topographical map of T4S-R4W Section 12 St. Meinrad Quadrangle. Color code: green:forest; blue:rivers, streams and ponds; red:farm and pasture lands; brown: roads and roadsides; black:sandstone quarry; purple: grape vineyard.



Figure 2. The Anderson river with surrounding mud flats.



Figure 3. The abandoned sandstone quarry.

The elevation of the section ranges from 400 to 580 feet. In a number of areas the incline is such that elevational and drainage changes allow observance of distinct habitat ranges for many of the plants. Generally in section 12, as with most of Spencer County, woods (Figure 4) and pasture land (Figure 5) are confined to the higher elevations while farmland (Figure 6) is located in the lower elevations. Highways and access roads (Figures 4, 5, and 6) transverse section 12 in most areas.



Figure 4. A wooded area of section 12 showing U.S. Highway 460.



Figure 5. Plateau atop section 12, looking West towards the grape vineyard and pond.



Figure 6. Farmland located at lower elevation, looking North-west. The St. Meinrad-Ferdinand Road serves as boundary between farmland and woods.

The top of section 12 terminates in a long, irregular plateau which serves mainly as pasture. Located on this plateau is a spring-fed pond (Figure 7) and a grape vineyard (Figure 8). The access roadway was a prime area for finding flowers of the composite family. Most of the legumes were found in the pasture land. Generally, little else was found in the area except grasses and sedges.

The purpose of this work is to collect and identify on a one year cycle the plants found within section 12 of Spencer County.



Figure 7. Looking East with the spring-fed pond in the foreground. In the distance can be seen the access road and the woods and pasture.

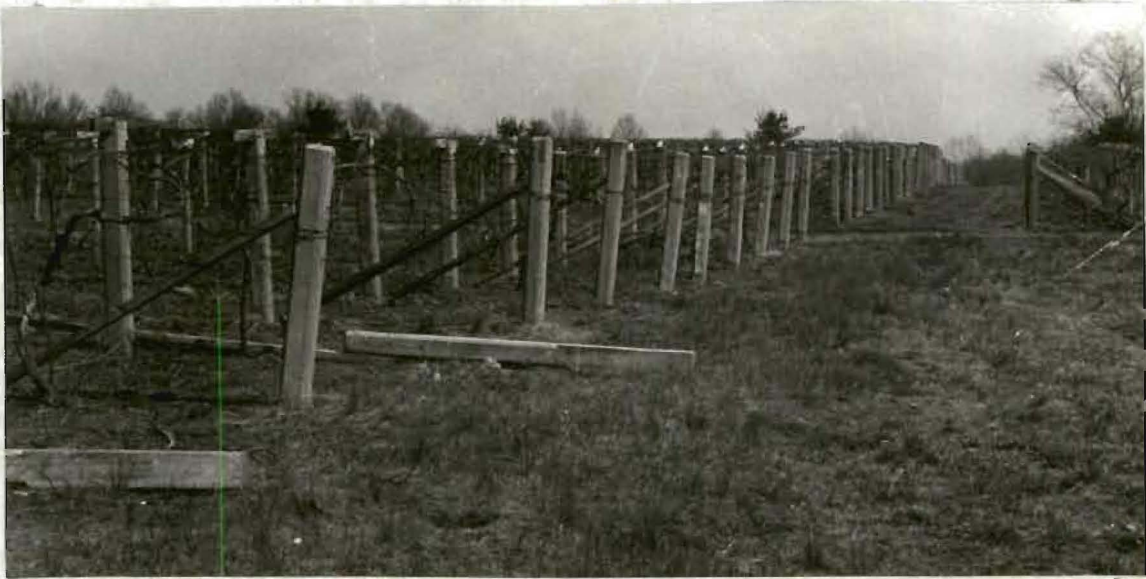


Figure 8. The grape vineyard.

II

MATERIALS AND METHODS

The plants were collected from January 1, 1971, to December 31, 1971, to provide a year-around assesment.

The section was covered systematically, using an enlarged map of section 12. A grid consisting of 10 acre square units was superimposed over the map. As plants were collected, they were located on the map by grid numbers (Figure 9).

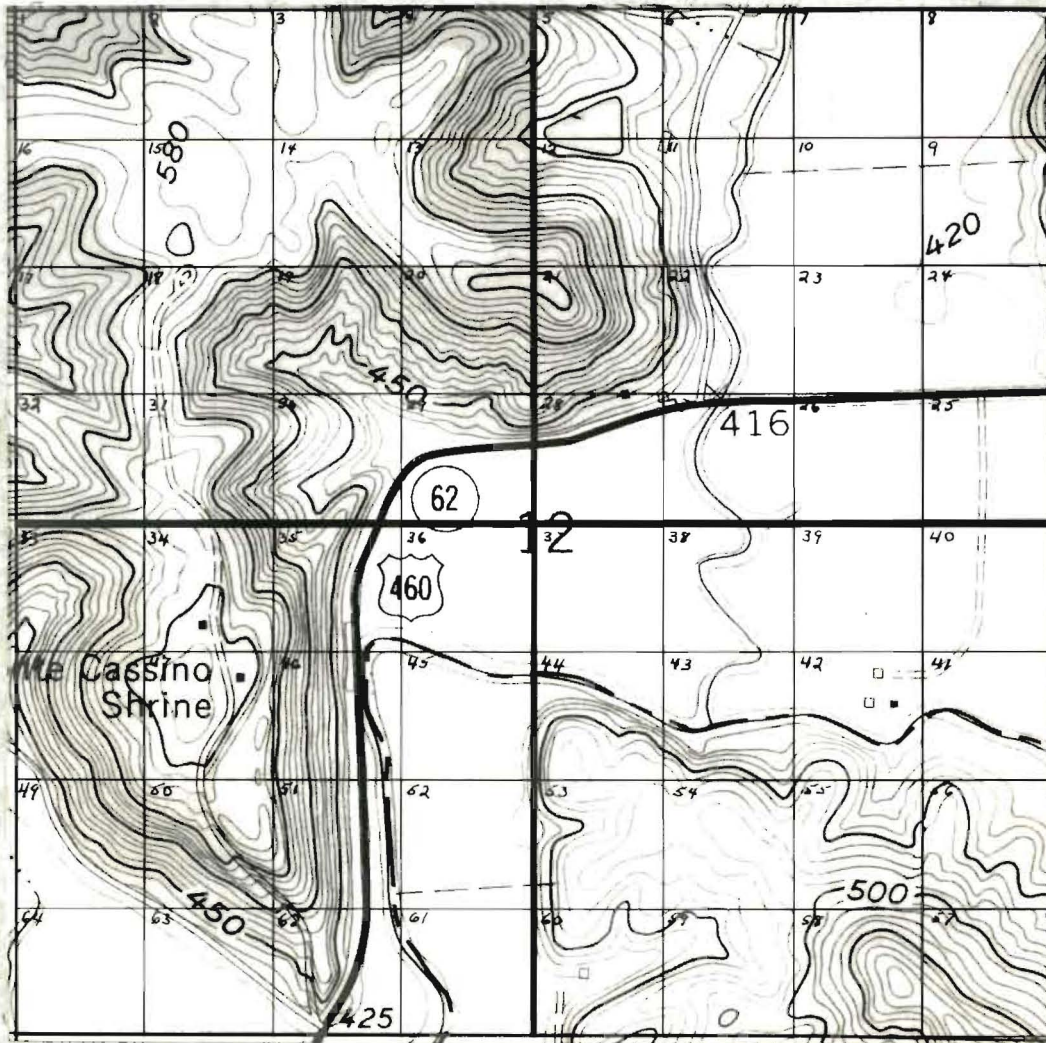


Figure 9. Enlarged map with grid superimposed.

Pressing was done in the field to insure preservation of natural characteristics. The plants were identified in the field according to families by using Peterson's Handbook, A Field Guide to Wildflowers, and Cobb's A Field Guide to the Ferns.

Upon arrival at the laboratory, genus and species were determined, using Gleason's The New Britton and Brown, An Illustrated Flora of the North-eastern United States and Canada.

Plants were mounted on standard 16½ x 12½ herbarium sheets using the following mounting medium:

75 gms. Dow Resin 276 V-2
250 gms. Dow Ethocel, (Standard 7CPS)
270 mls. Methanol
1080 mls. Toluene

The plants were cross checked for identification with Deam (1940), Greenwell (1935), Strausbaugh and Core (1952), and the Indiana University Herbarium records with the help of the Curator, Mr. Jack Humbles. Detailed record cards, as shown on the next page, were kept throughout the collecting and identification process.

Family:_____	Herbarium #:_____
Name:_____	Deam's #:_____
Common Name:_____	Student #:_____
State:_____	Hypogynous__ Perigynous__ Epigynous__
County:_____	Apetalous__ Choripetalous__ Sympetalous__
Township:_____	Stamens_____
Quadrangle:_____	Sepals_____
T__ R__	Carpels_____
Section:_____	Habitat:_____
Zone:_____	Exposure:_____
Collector:_____	Moisture:_____
Date:_____	Density:_____

EAGLE

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III

RESULTS

Table 1 lists the 119 plants collected between January 1, 1971 to December 31, 1971, in T4S-R4W Section 12 of Spencer County. An asterisk indicates new species reported for Spencer County. A map number from Deam's Flora of Indiana has been included for each species. Notation has been made where this is not the case, i.e., "NL: Not listed in Deam." In cases where a page number is given, this denotes that the plant is listed in Deam but does not have a map number.

Table 1. List of plants collected in Section 12:

PTERIDOPHYTA

<u>FAMILIES</u>	<u>Deam's No.</u>	<u>SPECIES</u>
Lycopodiaceae	55	* <u>Lycopodium complanatum</u> L. var. <u>flabelliforme</u> Oct. 4, 1971
Ophioglossaceae	4	<u>Botrychium dissectum</u> Spreng. Oct. 4, 1971
	5	<u>Botrychium virginianum</u> (L.) Sw. May 22, 1971
Polypodiaceae	38	<u>Adiantum pedatum</u> L. June 5, 1971
	30	<u>Asplenium platyneuron</u> (L.) Oakes May 22, 1971
	11	<u>Cystopteris fragilis</u> (L.) Bernh. May 22, 1971
	14	<u>Thelypteris hexagonoptera</u> (Michx.) Weatherby. August 14, 1971
	22	<u>Polystichum acrostichoides</u> (Michx.) Shott May 22, 1971

MONOCOTYLEDONEAE

<u>FAMILIES</u>	<u>Deam's No.</u>	<u>SPECIES</u>
Araceae	576	<u>Arisaema triphyllum</u> (L.) Schott. May 1, 1971
	574	<u>Arisaema dracontium</u> (L.) Schott. May 29, 1971
Commelinaceae	595	<u>Tradescantia virginiana</u> L. May 1, 1971
Liliaceae	639	<u>Allium canadense</u> L. May 29, 1971
	647	<u>Erythronium americanum</u> Ker. April 10, 1971
	649	<u>Ornithogalum umbellatum</u> L. May 15, 1971
		* <u>Muscari botryoides</u> (L.) Mill. April 10, 1971
	652	<u>Smilacina racemose</u> (L.) Desf. May 8, 1971
	657	* <u>Polygonatum biflorum</u> (Walt.) Ell. May 29, 1971
	660	<u>Trillium recurvatum</u> Beck. April 10, 1971
	664	<u>Trillium Gleasoni</u> Fern May 1, 1971
	681	<u>Iris cristata</u> Ait. May 1, 1971
		<u>Sisyrinchium bermudiana</u> May 15, 1971
Orchidaceae	727	* <u>Aplectrum hyemale</u> (Muhl.) Torr. May 22, 1971

DICOTYLEDONEAE

<u>FAMILIES</u>	<u>Deam's No.</u>	<u>SPECIES</u>
Aristolochiaceae	821	<u>Asarum reflexum</u> Bickn. May 8, 1971
Polygonaceae	825	<u>Rumex Acetosella</u> L. May 1, 1971
	848	<u>Polygonum punctatum</u> Ell. Sept. 30, 1971
Portulacaceae	893	<u>Claytonia virginica</u> L. March 21, 1971
Caryophyllaceae	899	<u>Stellaria media</u> (L.) Cyrill March 13, 1971
	897	* <u>Stellaria pubera</u> Michx. April 24, 1971
	900	* <u>Cerastium vulgatum</u> L. April 24, 1971
	923	<u>Silene virginica</u> L. May 22, 1971
	925	* <u>Dianthus Armeria</u> L. June 12, 1971
Ranunculaceae	938	* <u>Actaea Alba</u> (L.) Mill. May 1, 1971
	943	<u>Delphinium tricornes</u> Michx. April 24, 1971
	936	<u>Isopyrum biternatum</u> (Raf.) T.&G. May 8, 1971
	963	<u>Ranunculus abortivus</u> L. Britt. March 27, 1971
	972	<u>Ranunculus hispidus</u> Michx. May 15, 1971

Berberidaceae	979	<u>Podophyllum peltatum</u> L. May 8, 1971
Papaveraceae	990	<u>Sanguinaria canadensis</u> L. April 3, 1971
Fumariaceae	994	<u>Dicentra cucullaria</u> (L.) Bernh. April 3, 1971
	993	<u>Dicentra canadensis</u> (Goldie) Walp. April 24, 1971
Cruciferae	1008	* <u>Brassica campestris</u> L. April 17, 1971
	1001	* <u>Thlaspi arvense</u> L. June 12, 1971
	1031	* <u>Capsella Bursa-pastoris</u> (L.) Medic. April 10, 1971
	1035	* <u>Draba verna</u> L. April 3, 1971
	1025	* <u>Cardamine pennsylvanica</u> Muhl. March 13, 1971
	1029	<u>Dentaria diphylla</u> Michx. May 8, 1971
	1027	<u>Dentaria laciniata</u> Muhl. April 3, 1971
	1030	<u>Dentaria heterophylla</u> Nutt. April 24, 1971
	1006	* <u>Arabidopsis Thalina</u> (L.) Heyn. March 27, 1971
Rosaceae	1157	<u>Potentilla canadensis</u> L. May 8, 1971
	1146	* <u>Fragaria virginiana</u> Duchesne. April 24, 1971

Caesalpiniaceae	1194	<u>Cassia nictitans</u> L. Sept. 4, 1971
Fabaceae	1217	<u>Trifolium pratense</u> L. May 22, 1971
	1218	<u>Trifolium repens</u> L. May 1, 1971
	1220	<u>Trifolium procumbens</u> L. May 15, 1971
	1215	<u>Melilotus officinalis</u> (L.) Desr. May 29, 1971
	1266	* <u>Vicia villosa</u> Roth. May 29, 1971
	1283	<u>Strophostyles umbellata</u> (Muhl). Britt. Sept. 4, 1971
Oxalidaceae	1299	<u>Oxalis europaea</u> Jordan May 1, 1971
Geraniaceae	1289	<u>Geranium carolinianum</u> L. May 15, 1971
Balsaminaceae	1371	<u>Impatiens biflora</u> Walt. Oct. 4, 1971
Hypericaceae	1408	<u>Hypericum punctatum</u> Lam. Aug. 21, 1971
Violaceae	1438	<u>Viola papilionacea</u> Pursh April 16, 1971
	1440	* <u>Viola sororia</u> Willd. May 8, 1971
	1437	* <u>Viola Missouriensis</u> Greene May 27, 1971
	1435	<u>Viola triloba</u> Schw. May 1, 1971

	1448	<u>Viola eriocarpa</u> Schw. April 17, 1971
	1453	<u>Viola striata</u> Ait. May 15, 1971
	1451	<u>Viola Rafinesquii</u> Greene. April 3, 1971
Umbelliferae	1529	* <u>Erigenia bulbosa</u> (Michx.) Nutt. March 27, 1971
Apocynaceae	pg. 761	<u>Vinca minor</u> L. April 17, 1971
Convolvulaceae	1678	<u>Ipomoea hederaceae</u> (L.) Jacq. Sept. 4, 1971
	1675	<u>Ipomoea lacunosa</u> L. Sept. 4, 1971
	1671	* <u>Convolvulus sepium</u> L. May 29, 1971
Polemoniaceae	1691	<u>Polemonium reptans</u> L. April 24, 1971
Hydrophyllaceae	1695	* <u>Hydrophyllum macrophyllum</u> Nutt. June 5, 1971
Boraginaceae	1711	* <u>Lithospermum arvense</u> L. April 24, 1971
	1702	<u>Cynoglossum virginianum</u> L. May 22, 1971
Labiatae	1738	<u>Scutellaria incana</u> Biehler Aug. 21, 1971
	1745	* <u>Glecoma hederaceae</u> L. March 27, 1971
	1750	* <u>Synandra hispidula</u> (Michx.) Britt. May 22, 1971

	1751	<u>Lamium</u> <u>aplexicaule</u> L. April 10, 1971
	1761	<u>Salvia</u> <u>lyrata</u> L. May 15, 1971
	1769	<u>Blephilia</u> <u>ciliata</u> (L.) Benth. June 12, 1971
Solanaceae	1804	<u>Solanum</u> <u>carolinense</u> L. June 12, 1971
Scrophulariaceae	1839	<u>Veronica</u> <u>peregrina</u> L. April 24, 1971
	1842	<u>Veronica</u> <u>arvensis</u> L. May 1, 1971
	1856	<u>Gerardia</u> <u>tenufolia</u> Vahl. Sept. 30, 1971
Orobanchaceae	1878	* <u>Conopholis</u> <u>americana</u> (L.) Wallr. May 29, 1971
Acanthaceae	1894	<u>Ruellia</u> <u>strepens</u> L. Aug. 28, 1971
Plantaginaceae	1902	<u>Plantago</u> <u>lanceolata</u> L. May 22, 1971
	1904	<u>Plantago</u> <u>virginica</u> L. May 1, 1971
Rubiaceae	1907	<u>Houstonia</u> <u>purpurea</u> L. May 22, 1971
	1922	<u>Galium</u> <u>Aparine</u> L. May 8, 1971
	1916	<u>Galium</u> <u>circaezans</u> Michx. June 5, 1971
	1926	<u>Galium</u> <u>concinnum</u> T.&G. June 12, 1971

Valerianaceae	pg. 890	* <u>Valerianella olitoria</u> (L.) Poll. April 24, 1971
Campanulaceae	Not listed	<u>Tiodanis perfoliata</u> (L.) Nieuwl. May 29, 1971
Compositae	2112	<u>Rudbeckia hirta</u> L. June 12, 1971
	2155	<u>Bidens aristosa</u> (Michx.) Britt. Sept. 4, 1971
	2144	* <u>Coreoposis lanceolata</u> L. June 12, 1971
	2170	<u>Achilles millefolium</u> L. May 22, 1971
	2172	<u>Chrysanthemum leucanthemum</u> L. May 15, 1971
	NL	* <u>Matricaria Chamomilla</u> L. May 22, 1971
	2186	<u>Senecio glabellus</u> Poir. May 1, 1971
	2007	<u>Solidago caesia</u> L. Oct. 4, 1971
	2013a	* <u>Solidago juncea</u> Ait. Sept. 4, 1971
	2073	<u>Erigeron philadelphicus</u> L. May 15, 1971
	2075	<u>Erigeron annuus</u> (L.) Pers. June 12, 1971
	2036	<u>Aster Shortii</u> Lindl. Sept. 30, 1971
	2061	* <u>Aster pilosus</u> Willd. Sept. 30, 1971

IV

DISCUSSION

In the thirty years since Deam's Flora of Indiana was published, there has been only one major effort at reassessing the flora of Spencer County. This first re-assessment was done by Betz in 1961 and was for spring flora only.

The work done in this thesis gives a more extensive coverage of the plants of Spencer County as found in a representative section of the county and was conducted over a period of a year. Of the 119 species collected and identified, 34 have been determined as new species for Spencer County.

(Table 2.)

Table 2. New Plants Found in Spencer County

<u>FAMILIES</u>	<u>Deam's No.</u>	<u>SPECIES</u>
Lycopodiaceae	55	<u>Lycopodium complantum</u> L. var. flabelliforme
Liliaceae	pg. 316	<u>Muscari botryoides</u> (L.) Mill
	657	<u>Polygonatum biflorum</u> (Walt.) Ell.
Orchidaceae	727	<u>Aplectrum hyemale</u> (Muhl.) Torr.
Caryophyllaceae	897	<u>Stellaria pubera</u> Michx.
	900	<u>Cerastium vulgatum</u> L.
	925	<u>Dianthus Armeria</u> L.
Ranunculaceae	938	<u>Actaea Alba</u> (L.) Mill.

Cruciferae	1008	<u>Brassica campestris</u> L.
	1001	<u>Thlaspi arvense</u> L.
	1031	<u>Capsella Bursa-pastoris</u> (L.)
	1035	<u>Draba verna</u> L.
	1025	<u>Cardamine pennsylvanica</u> Muhl.
	1006	<u>Arabidopsis Thalina</u> (L.) Heyn.
Rosaceae	1146	<u>Fragaria virginiana</u> Duchesne.
Fabaceae	1266	<u>Vicia villosa</u> Roth
Violaceae	1440	<u>Viola sororia</u> Willd.
	1437	<u>Viola Missouriensis</u> Greene
Umbelliferae	1529	<u>Erigenia bulbosa</u> (Michx.) Nutt.
Convolvulaceae	1671	<u>Convolvulus sepium</u> L.
Hydrophyllaceae	1695	<u>Hydrophyllum macrophyllum</u> Nutt.
Boraginaceae	1711	<u>Lithospermum arvense</u> L.
Labiateae	1745	<u>Glechoma hederaceae</u> L.
	1750	<u>Synandra hispidula</u> (Michx.) Britt.
Orobanchaceae	1878	<u>Conopholis americana</u> (L.) Wallr.
Valerianaceae	pg. 890	<u>Valerianella otlitoris</u> (L.) Poll.
Compositae	2078	<u>Antennaria neglecta</u> Greene.
	2061	<u>Aster pilosus</u> Willd.
	2228	<u>Pyrrhopappus carolinianus</u> (Walt.) DC.

2144	<u>Coreopsis lanceolata</u> L.
2207	<u>Krigia biflora</u> (Walt.) Blake
2013a	<u>Solidago juncea</u> Ait.
2210	<u>Taraxacum officinale</u> Weber
NL	<u>Matricaria Chamomilla</u> L.

In evaluating the 34 new species for Spencer County, a number of ideas immediately suggest themselves: the majority of the new species find their normal habitat along roadsides or in farm fields and were in all probability introduced in Spencer County through agricultural planting. The normal means of plant dissemination such as wind, animals, etc., must surely have played an important role in the introduction of these plants into the county. Along with the above two points, there is always the possibility that they were overlooked on previous occasions.

An interesting point is that 19 of the new species reported for Spencer County are also listed by Deam as being found in one of the three adjacent counties: Perry, Warwick, and Dubois. In only three instances are any of the species reported new for Spencer County found in all the adjacent counties. (Table 3.)

Table 3. Comparison of Plants Found in Spencer, to Perry,
Dubois and Warwick Counties:

<u>Spencer County</u>	<u>Perry</u>	<u>Dubois</u>	<u>Warwick</u>
<u>Lycopodium complantum</u> L. var. flabelliforme			
<u>Muscari botryoides</u> (L.) Mill.			
<u>Polygonatum biflorum</u> (Walt.) Ell.	*	*	*
<u>Aplectrum hyemale</u> (Muhl.) Torr.	*		
<u>Stellaria pubera</u> Michx.	*	*	*
<u>Cerastium vulgatum</u> L.	*		*
<u>Dianthus Armeria</u> L.	*	*	*
<u>Actaea Alba</u> L. Mill.	*	*	
<u>Brassica campestris</u> L.			
<u>Thlaspi arvense</u> L.			
<u>Capsella Bursa-pastoris</u> L.	*		*
<u>Draba verna</u> L.			
<u>Cardamine pennsylvanica</u> Muhl.	*		*
<u>Arabidopsis Thalina</u> (L.) Heyn.	*		*
<u>Fragaria virginiana</u> Duchesne.			
<u>Vicia Villosa</u> Roth			
<u>Viola sororia</u> Willd.			
<u>Viola Missouriensis</u>			*
<u>Eriogonum bulbosa</u> (Michx.) Nutt.	*		
<u>Convolvulus sepium</u> L.	*		*
<u>Hydrophyllum macrophyllum</u> Nutt.	*		*
<u>Lithospermum arvense</u> L.			
<u>Glechoma hederaceae</u> L.			
<u>Synandra hispidula</u> (Michx.) Britt.			
<u>Conopholis americana</u> (L.) Wallr.	*		
<u>Valerianella otlitoria</u> (L.) Poll.			
<u>Antennaria neglecta</u> Greene.			
<u>Aster pilosus</u> Willds	*		
<u>Pyrrhopappus carolinianus</u> (Walt.) DC			*
<u>Coreopsis lanceolata</u> L.			
<u>Krigia biflora</u> (Walt.) Blake	*		
<u>Solidago juncea</u> Ait.		*	
<u>Taraxacum officinale</u> Weber			
<u>Matricaria Chamomilla</u> L.		*	

Perry, Warwick, and Dubois counties, like Spencer, are among the least populated counties in Indiana, having much the same climate and habitat, and they are, in varying degrees, prime areas for the finding of new species.

V

SUMMARY

A specimen of each plant collected has been placed in the Indiana University Herbarium at Bloomington, Indiana. New species have been incorporated into the official list of plants found in Indiana and Spencer County. A specimen of each plant collected has also been incorporated into the Henrietta Herbarium of Saint Meinrad College, St. Meinrad, Indiana.

The 119 specimens collected, represent 41 Families, 93 Genera and 119 Species. Of these, 34 Species have been recorded as new for Spencer County. The specimens collected represent a year-around appraisal. All specimens were collected in T4S-R4W Section 12 of Spencer County, with the exception of Lycopodium companatum L., which was collected in T4S-R4W Section 2 of Spencer County and included in the listing because of its rarity in Indiana.

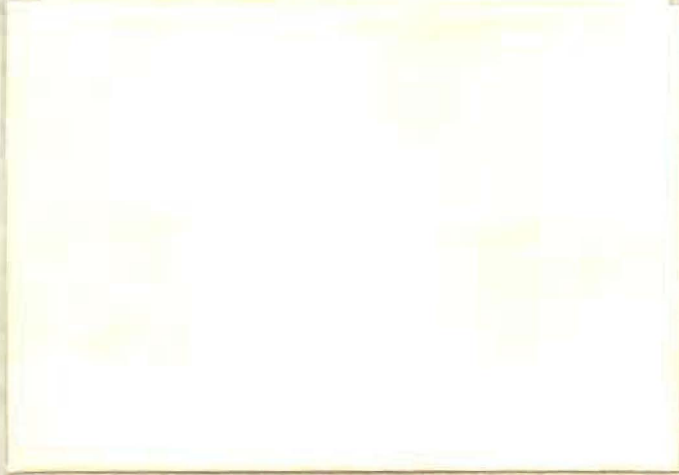
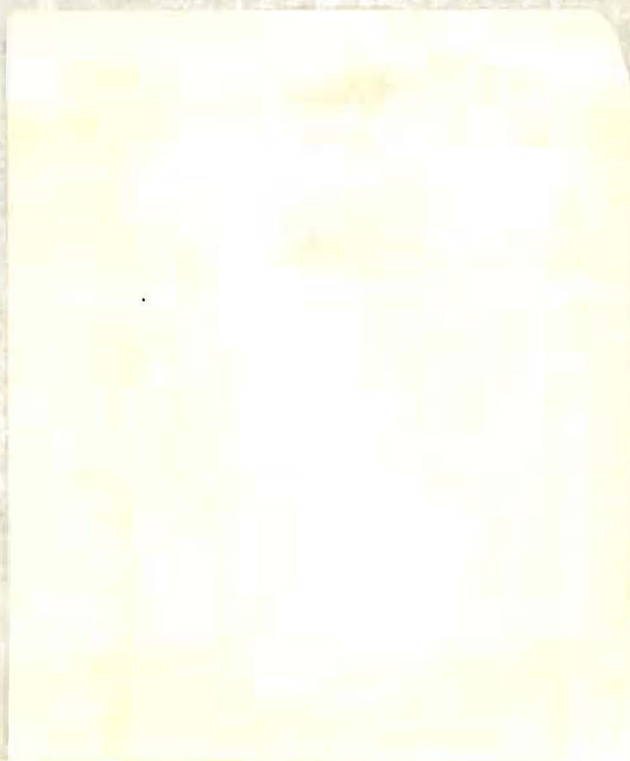
VI

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