

**MANCHESTER UNIVERSITY'S PLANT COLLECTION:  
AN IMPORTANT PLANT RESOURCE FOR  
NORTHEASTERN INDIANA**

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ABSTRACT

Small plant collections are an essential resource for research in under-sampled or unknown areas. Manchester University (MU), located in Wabash County in northeastern Indiana, has a rich and lengthy history in the natural sciences and has housed a plant collection since the beginnings of the institution in 1889. Manchester University's plant collection holds 4,658 specimens spanning more than 1,546 species. 59.7% of the specimens were collected in Wabash County, Indiana, thereby providing an excellent sample of the flora of northeastern Indiana. The collection has specimens added by MU professors as well as by students and members of the community, making it a unique collection demographically. Manchester's plant collection houses specimens from relatively under-collected regions of Indiana that fills a gap in the distribution maps of many species in the state. In addition, it holds records of several species that are likely now extirpated from the area. This survey hopes to make this collection more accessible and to support an application to list this collection in Index Herbariorum. This would allow local conservation groups and researchers to expand their knowledge of northeastern Indiana's natural heritage.

KEYWORDS: Manchester University, plant collection, Wabash County, small herbaria, flora of northeastern Indiana

INTRODUCTION

Herbaria have long played an important role in the collective botanical knowledge of the scientific community. These collections of plants provide botanists with a systematic way to record the occurrence of species throughout space and time (Baird 2010). Herbaria play such a crucial role in our understanding of horticultural plants, the natural world, and economic plants that many institutions have spent large amounts of resources over the last four centuries in order to expand and catalog the world's plant diversity (Besnard et al.

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2018). However, not all botanical collections are this extensive and widely available to researchers. Many plant collections across the world are small herbaria that typically contain less than 10,000 specimens (Harris and Marsico 2017). Despite their modest size, these small herbaria are often the only records of plants in many localities, particularly areas that are rural and underserved by the scientific community.

Small herbaria provide essential running records of local flora that can be used by researchers to potentially evaluate genetic variation within a species over time (Cozzolino et al. 2006), analyze local patterns of extinction (McGraw 2001), and understand the impact humans have had on local plant communities (Lavoie 2012). Local herbaria also house records of historical plant distributions, which provide snapshots of the land and its conditions at different time periods. This information can be used by historians and ecologists to fill gaps in our knowledge of local history and to draw connections between people and the land they live on. Knowing what specimens an herbarium holds is essential to understanding the historical importance of an area and making valuable resources available to researchers to aid in their studies of broader environmental and conservation issues.

Faculty members at Manchester University, a small liberal arts university in Wabash County Indiana, have been collecting plants since the university's beginning in the late 1800s. By 1895, the university already housed 1,200 specimens in its collection. This collection consisted of a "nearly complete record of the flowering plants of Wabash county, including many specimens that were rare at the time" (Eberly 2005). The vascular plant collection has had significant additions since these initial collections. Manchester University's plant collection acts as a nearly complete catalog of local flora in northeast Indiana. It also houses collections from throughout Indiana, as well as the United States.

Despite being small, the collection at MU can still provide researchers and historians with an important look into Wabash County's ecological past. This collection houses many records for one of the most under-collected and undocumented areas of the Indiana flora. In particular, Wabash County has undergone tremendous land-use changes since the initial collections in the late 1800s. This under-collection of plant specimens is particularly concerning as northeast Indiana was dominated by forests before being converted to mainly agricultural land (80–90%) by European settlers (Hedge 1997; Radeloff et al. 2005). The plant collection likely hosts records for many plants that are now locally extirpated as well as county records that have been unexamined in major North American floristic studies.

The collection at MU is currently uncatalogued and is not recognized in Index Herbariorum (Thiers 2021) as an herbarium available for researchers to use. The plant collection likely represents a missing puzzle piece in the distribution of many species in the Indiana flora. Manchester University's collection would be the first and only recognized herbarium in Wabash County to be made accessible for research purposes, thereby providing this under-sampled area with a valuable scientific resource. In order to understand what MU could offer the scientific community, we completed a census of its vascular plant collections. In particular, we wanted to know who the major collectors were, to survey the geographic

area that the collection represents, and to understand the diversity held in the collection. This information will help contribute to the better understanding and historical distribution of plants in northeastern Indiana and will promote the better use of herbaria in local conservation efforts.

### HISTORY OF THE NATURAL SCIENCES AT MANCHESTER UNIVERSITY

Manchester University is a small, private school in North Manchester, Indiana, a town roughly 40 miles from Fort Wayne in northeastern Indiana. The school was founded by the Church of the Brethren (with which it is still affiliated) in 1860 as Roanoke Classical Seminary in Roanoke, Indiana but did not officially become Manchester College until 1889 when the school was moved 30 miles west to the town of North Manchester (Manchester University 2020). Albert B. Ulrey (A.B. Ulrey) (Figure 1) was the first professor of the natural sciences to teach at Manchester, appearing on the class roster in 1891 teaching classes in botany, bacteriology, zoology, geology, and sanitation. Thanks to A.B. Ulrey and other collectors, the school had a modest plant collection in 1895 despite being such a young institution. According to a school catalog written in 1895, the herbarium at the school contained “about twelve hundred specimens.



FIGURE 1. A.B. Ulrey (ca. 1892), the first natural science professor from 1891 to 1900, started the plant collection at Manchester College. Photo provided by the Manchester University Archives and Peace Studies Church of the Brethren Collection, North Manchester, Indiana.

A considerable number of rarer plants are represented. A fairly complete collection of the vertebrates and flowering plants of Wabash County has been arranged in systematic order” (Eberly 2005).

As Manchester College grew through the late 1800s, more classes were added to the curriculum and more professors were welcomed to the faculty. It was also during this time that A.B. Ulrey and his colleagues were developing a modern science curriculum and standard at Manchester. Based on course descriptions from the beginning of the school, it appears that students spent most of their time in labs or out in the field, learning practical and applied science. Experience-based classes allowed professors and their students to spend time in the field collecting plant specimens rather than sitting for lectures. Many of the plants that were collected by the professors and their classes were likely studied before being incorporated into the plant collection. Ulrey and his classes were especially active, collecting much of the original herbarium in the late 1800s during his years at Manchester.

Manchester College grew steadily after Ulrey retired in 1900 as the faculty expanded and the school drew in more students. The College experienced exponential growth in 1932 when it merged with Mount Morris College, another Brethren-affiliated school in Mount Morris, Illinois. This merger brought in many new science professors, including O.W. Neher. Neher taught mainly botany and, following the tradition of field-based education at Manchester, led many excursions to nearby states such as Ohio and Kentucky where students learned plant features and distribution (Eberly 2005). Much as for Ulrey, these field experiences allowed O.W. Neher to collect plants to use in class as well as to add to the existing plant collection. After O.W. Neher retired from Manchester College, the professors who took up his position continued the tradition of experience-based education and added their own specimens to the steadily growing plant collection (see Important Collectors, below).

#### PLANT SPECIMENS HELD AT MANCHESTER UNIVERSITY

The Manchester University plant collection holds a total of 4,658 specimens that represent roughly 1,546 species. These specimens have all been entered into a publicly viewable database available at Manchester University (2021). The most frequently collected species in the collection are *Barbarea vulgaris* W.T. Aiton with 22 specimens and *Acer saccharum* Marshall with 20 specimens. The family with the largest number of specimens in the collection is the Asteraceae with a total of 651 specimens, followed by the Poaceae with 335 specimens (Figure 2). The taxonomy of the plant collection largely follows taxonomic concepts from the 1980s and 1990s. This precluded us from doing a more fine-grain analysis of the collections and will require some detailed updating of the plant collection specimens.

Of the 1,546 species represented in the plant collection at Manchester, 35 species, spanning 48 specimens, are on the Indiana state threatened and endangered species list (Table 1). Many of these specimens are from the Indiana

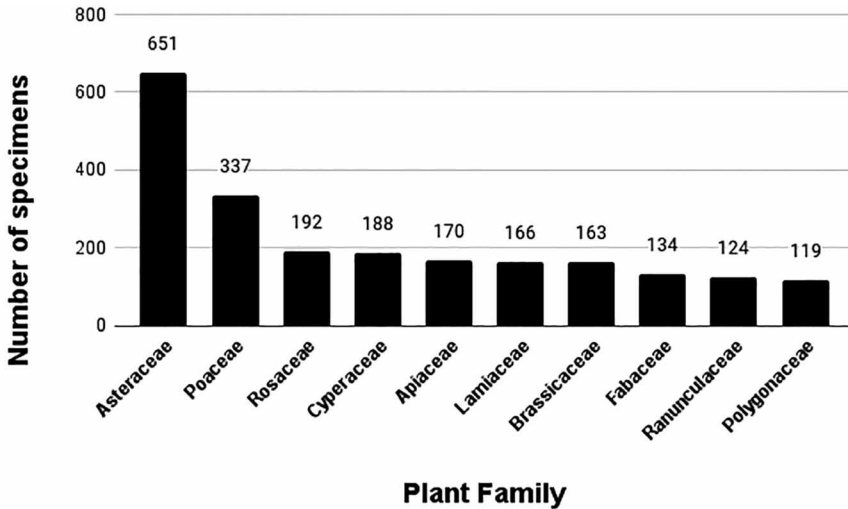


FIGURE 2. The 10 largest plant families represented in the Manchester University collection and the number of specimens in each. Taxonomy follows that of Voss and Reznicek (2012).

Dunes region collected in the 1940s. Numerous species growing in this area are listed by the Indiana DNR as rare, threatened, or endangered because of the unique habitat and its loss to urbanization. The collections at MU represent known populations that, mostly, have some sort of protection. However, more interestingly, the collection hosts an array of wetland and bog plants from Wabash County that were collected in the late 1800s. Many of these specimens, such as *Sarracenia purpurea* L., have not been observed in Wabash County since the 1800s. These specimens likely represent some of the last collections from wetland habitats that were drained and converted to farmland as the area developed into a hub of modern agricultural practices. Unfortunately, precise locations are not listed on the labels, but the habitat is likely gone (David J. Hicks, personal communication).

Specimens have been added in waves throughout the lifetime of the MU collection. These labs reflect particularly active collectors (see Important Collectors, below). The oldest specimen in the collection is a specimen collected by A.B. Ulrey, dated April 4, 1890. Most of Ulrey's 278 specimens in the herbarium were collected in 1890, and he made all the collections from the five-year period 1890–1895 (Figure 3). There are no collections made between 1895 and 1925. Only a few collections were made between 1925 and 1940 (likely a decline from the depression and WWII) but 629 specimens were collected in 1945–1949. Collection data did not increase until 2005 when 826 specimens were collected. Starting at this point and until 2019, most of the specimens in the herbarium were collected by David J. Hicks. The five-year period that saw the most collection was 2015–2019 with 1,045 specimens collected in that five-year time frame.

59.7% of the collections in the herbarium (2,442 specimens) were collected in

TABLE 1. Specimens of endangered, threatened, and rare plant species of Indiana held in the Manchester University herbarium. Taxonomy is based on the Indiana Department of Natural Resources list (DNR 2021). Only specimens labeled from and growing naturally in Indiana are included. State Ranks: SE = state endangered, ST = state threatened, WL = watch list. GRANK follows the convention of NatureServe (2021).

Species	State Rank/ GRANK	County	Date	Collector
<i>Ammophila breviligulata</i>	WL/G5	Porter	July 27, 1946	O.W. Neher
<i>Anaphalis margaritacea</i>	WL/G5	Kosciusko	October 1, 1988	Jacki Faris
		Miami	September 29, 1957	A. Wildermuth
		Wabash	August 12, 1890	A.B. Ulrey
		Wabash	September 27, 2009	David J. Hicks
		Wabash	September 23, 1947	Raymond Hartsough
<i>Arctostaphylos uva-ursi</i>	ST/G5	Porter	July 27, 1946	O.W. Neher
<i>Cakile edentula</i> var. <i>lacustris</i>	WL/G5T3T5	Porter	July 27, 1946	O.W. Neher
<i>Carex cephaloidea</i>	ST/G5	Steuben	July 6, 2018	David J. Hicks
<i>Carex leptalea</i>	WL/G5	Kosciusko	June 15, 2016	David J. Hicks
		Miami	May 18, 2015	David J. Hicks
		Steuben	May 22, 2018	David J. Hicks
<i>Carex trichocarpa</i>	WL/G4	Miami	May 18, 2015	David J. Hicks
<i>Castanea dentata</i>	SE/G4	Wabash	1890	A.B. Ulrey
<i>Comptonia peregrina</i>	WL/G5	Porter	July 27, 1946	O.W. Neher
<i>Cypripedium acaule</i>	SE/G5	Kosciusko	1935	O.W. Neher
<i>Cypripedium candidum</i>	ST/G4	Wabash	June 24, 1890	A.B. Ulrey
<i>Cypripedium reginae</i>	ST/G4G5	Wabash	June 14, 1956	P.A. Orpurt
<i>Dactylorhiza viridis</i>	SE/G5	Wabash	May 13, 2013	David J. Hicks
<i>Drosera rotundifolia</i>	WL/G5	Elkhart	August 30, 1950	O.W. Neher
<i>Euphorbia polygonifolia</i>	ST/G5?	Porter	July 27, 1946	O.W. Neher
<i>Filipendula rubra</i>	WL/G4G5	Wabash	August 4, 1890	A.B. Ulrey
		Wabash	August 5, 1947	O.W. Neher
<i>Hudsonia tomentosa</i>	ST/G5	Porter	July 27, 1946	O.W. Neher
<i>Hydrastis canadensis</i>	WL/G3G4	Wabash	July 26, 2009	David J. Hicks
<i>Hypericum adpressum</i>	SE/G3	Jasper	July 14, 1994	David J. Hicks
<i>Lathyrus japonicus</i>	SE/G5	Porter	July 27, 1946	O.W. Neher
<i>Liparis loeselii</i>	WL/G5	Wabash	June 24, 2005	David J. Hicks
		Kosciusko	August 26, 2016	David J. Hicks
<i>Lycopodium clavatum</i>	WL/G5	Porter	May 18, 1961	M. Miller
<i>Myosotis laxa</i>	ST/G5	Porter	July 27, 1946	O.W. Neher
<i>Panax quinquefolius</i>	WL/G3G4	Wabash	August 25, 2008	David J. Hicks
		Wabash	August 7, 2007	David J. Hicks
<i>Panax trifolius</i>	WL/G5	Wabash	1890	A.B. Ulrey
<i>Pogonia ophioglossoides</i>	ST/G5	Wabash	23 June 1890	A.B. Ulrey
<i>Rhus aromatica</i> var. <i>Arenaria</i>	ST/G5T3Q	Porter	July 27, 1946	O.W. Neher
<i>Salix serissima</i>	ST/G5	Wabash	June 3, 1956	P.A. Orpurt
<i>Sarracenia purpurea</i>	ST/G5	Porter	July 27, 1946	O.W. Neher
		Wabash	1890	A.B. Ulrey
<i>Selaginella apoda</i>	WL/G5	Wabash	April 24, 1986	P.A. Orpurt
<i>Triantha glutinosa</i>	ST/G5	Steuben	July 18, 2018	David J. Hicks
<i>Trillium cernuum</i> var. <i>macranthum</i>	SE/G5T4	Whitley	May 8, 1956	R.L. McAdams
<i>Vaccinium macrocarpon</i>	ST/G5	Elkhart	August 30, 1950	O.W. Neher
		Wabash	June 23, 1890	A.B. Ulrey
<i>Valerianella chenopodiifolia</i>	WL/G4	Wabash	April 18, 1891	A.B. Ulrey
		Wabash	May 19, 1956	P.A. Orpurt
		Wabash	June 3, 1956	P.A. Orpurt
<i>Veratrum woodii</i>	WL/G5	Wabash	July 27, 2006	David J. Hicks

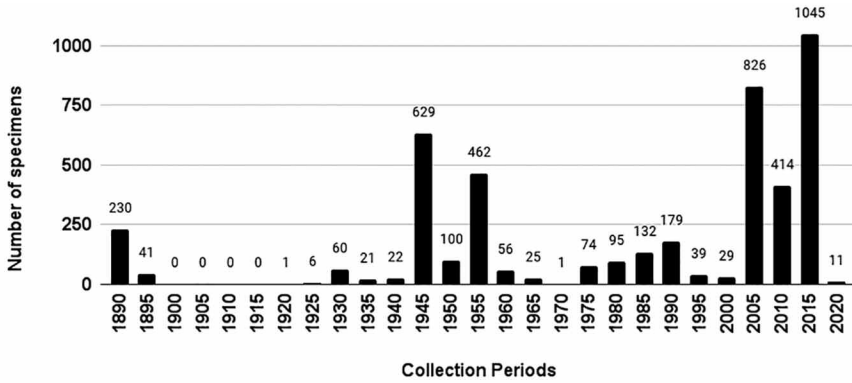


FIGURE 3. The number of plant collections deposited in the Manchester University herbarium in each five-year period beginning from the original collections in 1890 through July 2020. Collections begin on January 1 of the starting year and end on December 31 of the ending year (except July in the case of 2020).

Wabash county, where MU is located. This was followed by the nearby counties of Miami (12.7%), and Steuben (6.3%) (Figure 4). Specimens from Indiana account for 90.7% of the total collections in the herbarium; the remaining specimens are from 22 other states in the United States, except for one specimen each from Chile and Japan.

### IMPORTANT COLLECTORS

The most prolific collector of specimens in Manchester's plant collection is David J. Hicks, who was a professor at MU from 1986 until 2019, where he taught courses in genetics, ecology, and botany. Dr. Hicks contributed 2,063 specimens to the herbarium, which constitutes 44.3% of the total (Figure 5). Hicks graduated from Colgate University in 1974 with a bachelor's degree in biology, and he earned his master's degree and Ph.D. from Cornell University in 1978 and 1982, respectively, with a focus on plant ecology (Manchester University 2020). Many of the collections from Hicks came from floristic surveys of local land easements, particularly properties managed by the local ACRES land trust, as well as from student floristic studies under his supervision.

Oscar W. Neher (O.W. Neher), a professor at Manchester from 1932 until 1954, taught classes in botany and microbiology (Eberly 2005). Neher contributed 667 specimens to the herbarium, which constitutes 14.3% of the total (Figure 5). Neher earned his bachelor's degree from Iowa State College of Agriculture and Mechanical Arts in 1921 and his master's degree from the University of Chicago in 1930 (Eberly 2005). Initially, Neher taught biology at Mount Morris College until its merger with Manchester, when Neher became an associate professor of biology at Manchester College and began taking students on trips to

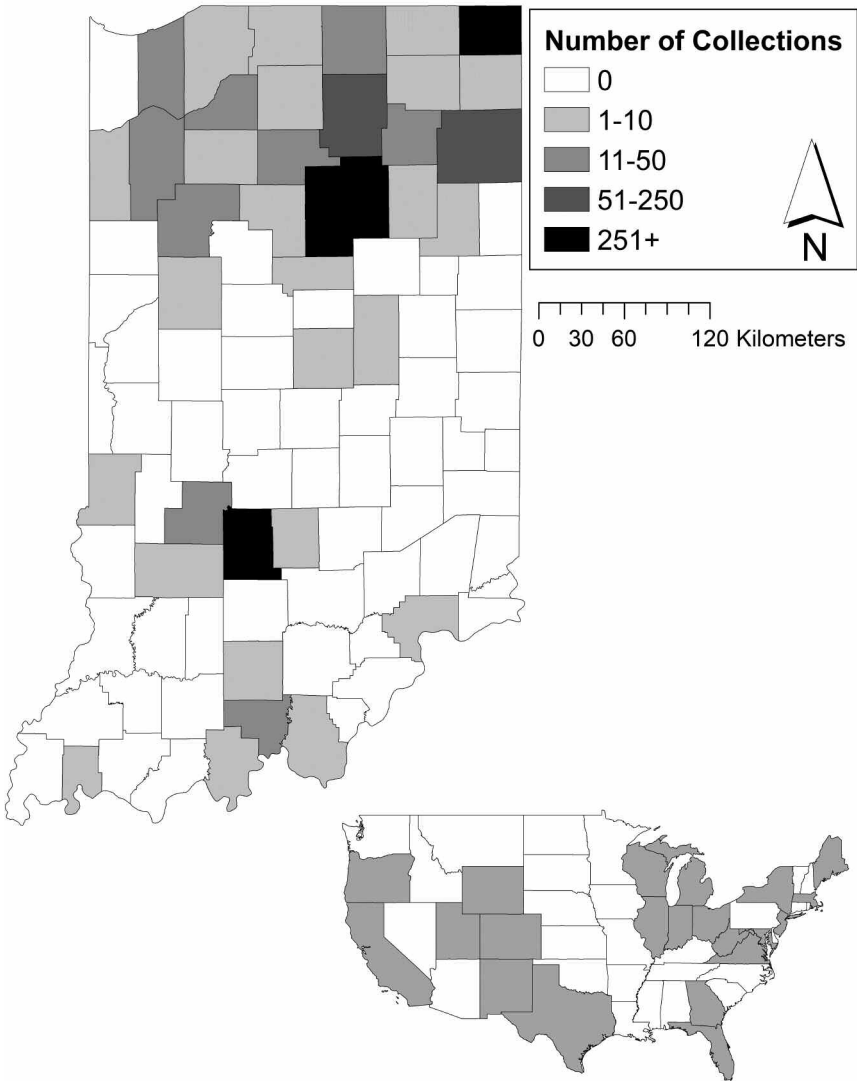


FIGURE 4. Collecting localities of specimens held in the Manchester University herbarium by state in the continental United States and by county in Indiana. Highlighted states are those represented by specimens in the collection. Counties in Indiana are color shaded by the number of collections from that particular county. The collections from Chile and Japan are not shown here.

neighboring states to observe plants (Eberly 2005). Many of Neher’s collections likely came from these trips as well as from his personal collection started at Mount Morris College. Neher was also one of two professors who took it upon themselves to plant a variety of rare and exotic trees on campus. Many of these



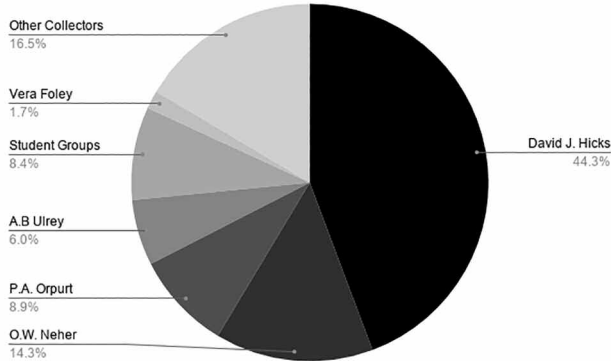


FIGURE 5. Major collectors of the Manchester University plant collection and the percentage of the collection accredited to each of them.

plantings are included in the herbarium in addition to many naturally occurring specimens.

Philip A. Orpurt taught at MU from 1954 to 1989. He contributed 413 specimens to the herbarium, or 8.9% of the total (Figure 5). After earning his bachelor's degree in biology from Manchester College in 1948, Orpurt attended the University of Wisconsin, where he received his master's degree in 1950 and his Ph.D. in 1954 with a specialization in botany, mycology, and plant ecology (Eberly 2005). He returned to Manchester College in 1954 to replace O.W. Neher and took up teaching courses in biology, historical geology, botany, and genetics (Eberly 2005). Many of Orpurt's collections represent his time in Wisconsin, and a few are collections of diseased plants, a specialty of his. Orpurt also made fungal collections that are housed at MU; these are not, however, currently inventoried.

The final major contributor to the plant collection is A.B. Ulrey, who contributed 278 specimens to the herbarium, or 6.0% of the total (Figure 5). Despite not receiving his bachelor's and master's degrees from Indiana University until 1892 and 1894, respectively, Ulrey was listed as the only science professor at Manchester College in the spring of 1891 (Eberly 2005). School records show Ulrey teaching courses in zoology, botany, geology, and chemistry, along with many practical labs in 1896. Ulrey set the model for much of the development of the sciences at MU by emphasizing practical hands-on instruction, which included many student contributions to MU's plant collection.

#### CONTRIBUTIONS OF WOMEN TO BOTANY AT MANCHESTER UNIVERSITY

Of the 4,658 specimens in Manchester University's plant collection, 200 were collected by women, making up 4.3% of the total. The two most prolific female



FIGURE 6. Professor Sadie Stutsman Wampler, seated on the right, and her painting class (ca. 1910). She frequently used specimens held at Manchester as models for her classes and painted them in realistic color. Photo provided by the Manchester University Archives and Peace Studies Church of the Brethren Collection, North Manchester, Indiana.

collectors, Vera Foley, with 77 collections, and Joyce Rupel, with 33 collections, together contributed 110 plants, or 55% of the contributions made by women (Figure 5). Unfortunately, not much is known about these two women other than their contributions to the MU collections. However, we do know that Rupel collected all but one of Manchester's specimens from southern California, and that Foley collected specimens from northeastern Indiana. We also believe that Foley and Rupel could have been students at Manchester, since most of their collections were made in a single year. Another notable collector is Barbara J. Ehrhardt, who is the only professor among the female collectors, having taught at Manchester from 1989 until 2004. Ehrhardt graduated from Manchester College in 1989 with a bachelor's degree in environmental studies and then again with a master's degree in 1994. Ehrhardt started her teaching at Manchester as a teaching assistant in field biology during her senior year in 1989. This allowed Ehrhardt to join the faculty later as Professor of Environmental Education. In 1991, Ehrhardt became Director of the Koinonia Environmental and Retreat Center, a nature preserve owned by MU and used by its environmental studies students (Eberly 2005).

Women have also done more than just collect specimens for MU's plant col-

lection. In the earlier years of the collection, art professor Sadie Stutsman Wampler and her art students painted watercolors of specimens and collected them into books (Figure 6). Had these books remained in the plant collection, they would have served to preserve aspects of plants that would fade over time, such as color and patterns on leaves, branches, or flowers. However, they are currently held in the Manchester University archives on the North Manchester campus.

### FUTURE PLANS FOR THE PLANT COLLECTION AT MANCHESTER UNIVERSITY

Our goal for this project was to understand what the plant collection at Manchester University has to offer and to make it available for use by researchers outside of the university. In the future, we hope that researchers will use the plant collection as a resource for projects throughout northeastern Indiana as well as add to the overall knowledge of the Indiana flora. In addition, we hope to eventually submit an application for the herbarium to be added to Index Herbariorum in order to further these goals.

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