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VASCULAR-PLANT TYPE SPECIMENS IN THE OHIO STATE UNIVERSITY HERBARIUM 1, 2

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ABSTRACT

The Ohio State University Herbarium now contains over 200 specimens of vascular plants that have been designated as types. These types are listed here, with information about the original source collection in which each type was located, data appearing on the label (locality, date, collector), the kind of type, and the citation of the original publication.

Since the establishment of The Ohio State University Herbarium by Professor William Ashbrook Kellerman shortly after his appointment in 1891 as the first professor of botany in the University, the vascular-plant herbarium has grown to approximately 200,000 specimens, of which 110,000 are Ohio plants. Among out-of-state plants, the herbarium has specimens from all of the states in the United States, with emphasis on grasses, pteridophytes (especially Equisetum), flowering plants from southeastern United States and Kansas, and aquatic plants from the Great Lakes area. Significant collections from outside the United States are from Arctic North America, Panama, and Guatemala.

From among these collections, over 200 specimens of vascular plants have now been designated as types. These type specimens comprise one of the most valuable portions of this natural-history research collection, because they are one of the sources forming the basis on which new taxa are named. The first section of this paper is an annotated list of those noteworthy original source collections presented to The Ohio State University Herbarium in which types specimens were located. This list is arranged nearly chronologically according to the receipt of these collections by the University Herbarium. Information is given on approximate total numbers of specimens and numbers of types in each collection, how and when each collection was acquired, and selected publications based on each collection.

The second section of this paper is an alphabetical list of the type specimens by scientific name. A number in parentheses after the name of each type specimen corresponds with the number assigned to its related source collection listed in the first section of the paper. Information given on the label (locality, date, and collector), reference citation, and the kind of type are recorded for each specimen. The kinds of types are designated according to information from both the labels and the literature. When known to the authors, the institution(s) having the holotype or other duplicate types is/are also noted. The data on all of the specimens labels have been checked with the published data, and all type designations are believed to be correct and consistent with the International Code of Botanical Nomenclature (Regnum Vegetabile 82: 426 p. 1972).

Holotypes, isotypes, syntypes, iso syntypes, lectotypes, and one neotype are cited. Topotypes are not cited, except for those few from Ohio which were obtained by the collector of the original (or holotype) specimen at the type locality within five years from the date the holotype was collected. In some cases, as noted, the topotype comes from the same tree as the holotype. Abbreviations of

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1 Contribution from the Department of Botany (Paper No. 861) and the Herbarium of The Ohio State University.
2 Manuscript received November 17, 1972.


**ORIGINAL SOURCE COLLECTIONS CONTAINING TYPES**

1. Collections from various sources
   
   Since the founding of The Ohio State University Herbarium, contributions of vascular plants have been made by various individuals, or have been received on exchange or by gift from other institutions. The specific sources of the 44 type specimens in this grouping are not always known. These types are the basis for taxa described in one book and in 32 papers in 16 different journals from 1876 to 1972.

2. Thomas Henry Kearney, Jr. Personal Herbarium
   
   This collection of several thousand specimens is the personal, mostly pre-1900, herbarium of Mr. Kearney, and now forms a significant portion of The Ohio State University Herbarium. The specimens are stamped "Herbarium of T. H. Kearney, Jr." The collection is rich in types, a total of 74 being listed here, of which 27 were used by Kearney to describe new taxa. Most of the taxa he described were published in the *Bulletin of the Torrey Botanical Club* from 1893 to 1900 and the *Bulletin of the United States Department of Agriculture Division of Agriculture* from 1897 to 1901. Additional types are probably in the Kearney Collection, but have not yet been recognized. The remaining 47 of the 74 types in the Kearney Collection are specimens acquired by Kearney from his contemporaries. In order to determine the original source of each of these type specimens, the following subdesignations have been made.
   
   A. Alvan Wentworth Chapman Types
   B. August Gattinger Collections and Types
   C. Edward Lee Greene Types
   D. A. Arthur Heller Collections and Types
   E. Thomas H. Kearney, Jr., Collections and Types
   F. Charles Mohr Collections and Types
   G. George V. Nash Collections and Types
   H. John K. Small Types
   I. Other Types
   
   Wentz (1974) prepared an annotated list of 43 taxa described by Kearney, of which not all the holotypes are in the Kearney Collection at The Ohio State University Herbarium. Wentz provided evidence that Kearney's pre-1900 herbarium is indeed his personal herbarium. Therefore, the type designations of specimens in Kearney's Collection cited in the following catalogue have been made according to both Wentz's evidence and Kearney's annotations on the herbarium sheets. That is, those taxa described by Kearney that are represented in Kearney's personal herbarium in The Ohio State University Herbarium are considered to be holotypes. Duplicate types (isotypes or isosyntypes) are in other herbaria, particularly NY and US. Kearney's personal herbarium apparently came to The Ohio State University from the herbarium of the University of Tennessee about 1900, but other information on its acquisition is not known.

3. Plantae Exsiccatae Grayanae
   
   The specimens of this large exsiccatae set that are in The Ohio State University Herbarium were widely distributed by the Gray Herbarium of Harvard University in the early 1900's. The specimens are recognized by special printed labels with the notation "Plantae Exsiccatae Grayanae." Seven types have been noted from these exsiccatae in The Ohio State University Herbarium and perhaps there may be others. All of the taxa in our exsiccatae set were described from 1901 to 1917 in papers in *Rhodora* by Merritt Lyndon Fernald or his associates at the Gray Herbarium, where the holotypes presumably are located.

4. W. W. Eggleston Collections of *Crataegus*
   
   This collection of approximately 50 specimens of *Crataegus* was made in the early 1900's by W. W. Eggleston in Vermont, the St. Lawrence valley, and Massachusetts. Our set was
received on exchange from the herbarium of the Arnold Arboretum, Harvard University. Five types are known from our collection, all of them being the basis for species described by Charles Sprague Sargent in *Rhodora* from 1901 to 1905. The holotypes presumably are in the herbarium of the Arnold Arboretum.

5. **North American *Equisetum*** described by Alvah A. Eaton

This collection of about 50 specimens of *Equisetum* was prepared by Alvah A. Eaton and distributed to individuals and institutions in the early 1900's. The specimens are recognized by special printed labels with the notation, “Fern Bulletin Distribution. The Genus *Equisetum* In North America By Alvah A. Eaton.” Duplicate types from this series in The Ohio State University Herbarium form the basis of 11 taxa described by Eaton in Gilbert (1901) and in volumes 10–12 of the *Fern Bulletin* during 1902 to 1904.

6. **William Ashbrook Kellerman’s Collections of Vascular Plants from Guatemala**

This collection of approximately 700 specimens is the residue of material obtained by Professor Kellerman on his four botanical expeditions to Guatemala in 1905, 1906, 1907, and 1908. The bulk of the collections, some 4,084 specimens in 20 boxes, was shipped to the United States National Museum in 1955, whence some of the material was further distributed to other herbaria. Forty-four vascular-plant taxa are known to have been described from Kellerman’s vascular-plant collections. Kellerman himself described none of the taxa. The 14 isotypes that are known from The Ohio State University Herbarium date and are listed here from Kellerman’s first three trips. Holotypes and duplicate types are known to be at F, MICH, NY, and US. The 44 taxa with full data and the daily itinerary of dates and places with maps are presented by Lowden (1970, 1973).

7. **Edward Lee Greene Types**

Edward Lee Greene, an active taxonomist and prolific writer of the late nineteenth and early twentieth centuries, described or recombined over 4,400 new taxa (Crovello, 1972). Most of the holotypes supporting Greene’s new taxa are in the herbarium of Notre Dame University, Indiana. Twenty types have been designated from three sources in The Ohio State University Herbarium.

A. Sixteen types belong to collections probably received on exchange in the early 1900’s. These specimens were principally obtained during the period of 1898 to 1902 by S. M. Tracy in Texas, S. M. Tracy and F. S. Earle in Texas, F. S. Earle and Esther S. Earle in New Mexico, and C. F. Baker, F. S. Earle, and S. M. Tracy in Colorado and Texas.

B. Three types, *Gerardia decemloba*, *G. holmiana*, and *Megalodonta nudata*, came from the Kearney Herbarium (collection no. 2).

C. One specimen, *Castilleja confusa*, was part of the Ohio Agricultural Experiment Station Herbarium, Wooster, Ohio. The Experiment Station Herbarium was acquired by The Ohio State University Herbarium in 1968.

These duplicate types form the basis of some of the species which Greene described from 1899 to 1903 in volumes 4 and 5 of his own journal, *Pittonia*.

8. **Floyd Bartley and Leslie L. Pontius Collections from Ohio**

The hundreds of specimens collected jointly by these two amateur Ohio botanists form a large and significant portion of the Ohio plants in The Ohio State University Herbarium. Their specimens are principally from south-central Ohio. Mr. Bartley, a farmer, and the late Mr. Pontius, a postmaster, began contributing their specimens to The Ohio State University Herbarium in the 1930's, and Mr. Bartley, now in his 80's, continues to bring specimens to the University Herbarium. Many of the Bartley and Pontius collections are the basis for the *Check List of Vascular Plants* of Jackson and Vinton counties by Bartley (1959). An isotype of *Calamagrostis insperata* Swallen was described from a Bartley and Pontius specimen obtained in Jackson County, Ohio. An account of Bartley’s contribution to Ohio botany can be found in Stuckey (1971).
9. William C. Werner Personal Herbarium

The personal herbarium of William C. Werner of Painesville, Ohio, was presented to The Ohio State University Herbarium in 1936 (Schaffner, 1936). Mr. Werner was one of the early instructors in the Department of Botany of The Ohio State University and was a co-author with Professor Kellerman of the third Catalogue of Ohio Plants (Kellerman and Werner, "1893" [1894]).

In volume three of Britton and Brown (1898, p. 501), Britton described Panicum werneri from New York and Ohio, with the type from Painesville, Werner 60, presumably at US (Hitchcock and Chase, 1951, p. 925). Duplicate type specimens of P. werneri, however, were not located in Werner’s personal herbarium. One of his specimens, taken in 1892 at Georgesville, was designated by Heiser (1969) as a neotype of Helianthus occidentalis Riddell.

10. John H. Schaffner Collections of Equisetum

This collection, filling two standard-size herbarium cases, represents a portion of the material on this genus amassed by Professor Schaffner. He described only one species, Equisetum kansanum Schaffner (1912), of which the holotype and an isotype are in the collection. Thirty-three of his papers on the genus are listed in his bibliography compiled by Waller (1941, pp. 271–280).

11. Lewis S. Hopkins Personal Pteridophyte Herbarium

This collection of approximately 6,200 specimens of ferns and fern allies was acquired by The Ohio State University Herbarium in 1944 (Jones, 1944). These specimens can be recognized by the stamp, “Herbarium of Lewis S. Hopkins.” Five types have been designated in the collection and others probably exist. Four of the types are for taxa described by Hopkins (1910, 1917, 1919) and are here considered to be holotypes.

12. Stanford, Retherford, and Northcraft Collections from Coahuila, Mexico

This collection was made in 1941 by L. R. Stanford, K. L. Retherford, and R. D. Northcraft, and was probably received in the 1940’s by The Ohio State University Herbarium on exchange from the herbarium of the Arnold Arboretum or Gray Herbarium, Harvard University. Four isotypes are known from the collection, all of which come from near Jimulco, Coahuila, and are the basis for species described by the late Ivan M. Johnston (1943). The holotypes of our four isotypes are in the Gray Herbarium.

13. North Appalachian Experimental Watershed Herbarium

This set of 2,734 specimens documents the 1,315 taxa listed by Moldenke (1944) for the flora of the North Appalachian Experimental Watershed, located near Fresno, Chili, and Canal Lewisville, Coshocton County, Ohio. This locality is abbreviated “N. A. E. W.” on the labels and in the citations in the publication. Cultivated species, escapes, naturalized plants, and waifs are included, as well as native plants. From among these 2,734 specimens, eleven holotypes are the basis of eleven new forms described in two papers by Moldenke (1943, 1944). The North Appalachian Experimental Watershed Herbarium was probably presented to The Ohio State University Herbarium in the 1940’s.

14. William Starling Sullivant’s 1840 Collection of Vascular Plants from Ohio

Collected in 1840, the 390 specimens in this collection are the second oldest in The Ohio State University Herbarium. They were acquired by a transfer from the Horticulture Department of The Ohio State University and apparently represent the 375 specimens received in 1940 as reported by Jones (1940). The specimens were prepared by William Starling Sullivant, recognized world authority in bryology in the latter half of the nineteenth century. The entire collection may have come to the University from his brother, Joseph, who was instrumental in the founding of The Ohio State University, rather than from William himself, because the last remaining portion of William’s own vascular-plant herbarium was sent in 1868 to Asa Gray at Harvard University (letter to Asa Gray, 22 April 1868, at GH; Rodgers, 1940, p. 281).
The specimens of the entire Sullivant collection are all labeled with the name of the plant as originally identified and with the data, "Columbus, Ohio 1840 W. S. S." Our collection of Sullivant's vascular plants represents the largest known number of his plants remaining as a single unit. From among our 390 specimens, only three are types. The types of most of the 20 known taxa described from Sullivant's specimens of vascular plants have been located in several United States herbaria: GH, MO, NY, PH, and US.

15. Underwood and Selby Collection of Vascular Plants from Colorado

This collection of 718 specimens of vascular plants obtained in west-central Colorado in 1901 was prepared jointly by Professor Lucien Marcus Underwood of the New York Botanical Garden and Mr. Augustine Dawson Selby of the Ohio Agricultural Experiment Station. Our collection represents Selby's set of the specimens that was left in the Experiment Station Herbarium. This Herbarium was transferred to The Ohio State University Herbarium in 1968. Twenty taxa known to be named and described by Per Axel Rydberg in five papers in the Bulletin of the Torrey Botanical Club from 1904 to 1906 were based on Underwood's set of the specimens in the herbarium of the New York Botanical Garden. Isotypes for 11 of these taxa are in Selby's set of specimens and are listed here. An itinerary of the collecting trip based on Selby's set of specimens and Underwood's field notes has been presented by Stuckey and Hawk (1974).


This collection of grasses and sedges is an exsiccatae set of 200 specimens bound in a two-volume book. Prepared and distributed by Asa Gray in 1834 and 1835, this collection provided authentically identified specimens of North American grasses and sedges obtained largely in the pine barrens and on the coast of New Jersey in 1833 and in the central and western parts of New York between 1828 and 1835. Our two volumes of specimens were received in 1969 through exchange with the herbarium of the Academy of Natural Sciences of Philadelphia. These specimens are the oldest dated flowering plants in The Ohio State University Herbarium. In this book, two species of grasses, *Calamagrostis inexpansa* and *Panicum xanthophysum*, were validly published, the descriptions being printed on the labels with the specimens. Additional information on this rare book is given in Rickett and Gilly (1942) and in McVaugh (1968). Rickett and Gilly (1942, p. 466) designated the specimens in the herbarium of the New York Botanical Garden as the lectotypes.

17. James A. Duke Collection from Panama and Nearby Counties

The 3,419 specimens of this collection were prepared by James A. Duke and several associates in Panama. A few specimens also came from Colombia, Costa Rica, Ecuador, and Puerto Rico. The plants were collected during the 1960's as part of the field work conducted in connection with the Atlantic-Pacific Interocceanic Sea-level Canal in Central America by Battelle Memorial Institute, Columbus, Ohio. The Battelle Institute gave the collection to The Ohio State University Herbarium in 1971. Evidently several sets of specimens were collected in Panama. Most of the first set is in the herbarium of the Missouri Botanical Garden, with duplicates of certain families or genera distributed elsewhere. Our specimens represent primarily a second and third duplicate set. Three type specimens have been located, and probably others exist in our collection, but research has not progressed to an extent that the entire collection has been checked for type specimens. A list of new or proposed species resulting from the Sea-level Canal Survey, with collection numbers and the names of the authors but otherwise lacking in documentation, has been prepared by Duke and Porter (1970).

CATALOGUE OF TYPE SPECIMENS


OHIO: LICKING CO.: Cranberry Island, Buckeye Lake, 18 May, 9 Aug 1917; 5 Apr 1918, *F. Detmers s.n.* HOLOTYPE: 9 May 1910, ISOTYPE Ex Herb. Ohio Agricultural Experiment Station.


OHIO: WAYNE CO.: Wooster, 18 Jul 1907, L. S. Hopkins s.n., HOLOTYPE.


COLORADO: [OKAY CO.]: Ironton Park, 11 Sep 1901, L. M. Underwood & A. D. Selby 308, ISOTYPE.


TENNESSEE: COCKE CO.: Wolf Creek, 2 Sep 1897, T. H. Kearney, Jr. 691, SYNTYPE. Isotypes NY, US.


MONTANA: [JUDITH BASIN CO.]: Yogo Gulch, 22 Aug 1896, P. A. Rydberg 3405, ISOTYPE.


KENTUCKY: HARLAN CO.: Pine Mountain, yr. 1893, T. H. Kearney, Jr. 39, SYNTYPE.


COLORADO: [MONTZUMA CO.]: Durango, 18 Jul 1898, C. F. Baker, F. S. Earle, & S. M. Tracy 512, ISOTYPE.


GEORGIA: DEKALB CO.: Stone Mountain, 17 Jul 1893, J. K. Small s.n., ISOTYPE. Holotype NY.


MISSISSIPPI: [WAYNE CO.]: Waynesboro, 2 Oct 1886, T. H. Kearney, Jr. 136, ISOTYPE.


COLORADO: [OKAY CO.]: Ouray, 9 Sep 1901, L. M. Underwood & A. D. Selby 207, ISOTYPE.


GUATEMALA: DEP. CHOCO: Vicinity of Camp Curiche, s Boca Curiche, 26 May 1967, . A. Duke 11680, ISOTYPE. Holotype LL.


FLORIDA: [LAKE CO.]: Lake Ella, Bustis, yr. 1894, G. V. Nash 1139, HOLOTYPE. (Designation based on Kearney's annotation, "Type" [=Holotype], on the label).


COLORADO: [OKAY CO.]: Ouray, 17 Sep 1901, L. M. Underwood & A. D. Selby 74, ISOTYPE.


CHINA: KWANGTUNG. Kwong Ning District, Mung Haang above Koo Shui on the Sui River, yr. 1930 on the label, 1929 in the publication, F. A. McClure 17531-2, ISO-


Ohio: PORTAGE CO.: Near Windham, 3 Jun 1916, L. S. Hopkins s.n. HOLOTYPE.
<table>
<thead>
<tr>
<th>Species</th>
<th>Location</th>
<th>Collector</th>
<th>Date</th>
<th>Repository</th>
<th>Isotype Status</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bidens cernua var. elliptica</td>
<td>KENTUCKY: BELL CO.</td>
<td>T. H. Kearney, Jr.</td>
<td>Sep 1893</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td>(Designation based on Kearney's annotation, &quot;dupl. Co-Type!&quot;)</td>
</tr>
<tr>
<td>Brickellia bethollemani</td>
<td>BRICKELLIA: KENTUCKY, BELL CO.</td>
<td>Wiegand</td>
<td>Sep 1893</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td>(Designation based on Kearney's annotation, &quot;dupl. Co-Type!&quot;)</td>
</tr>
<tr>
<td>Bouvardia deamii</td>
<td>GUATEMALA: DEP. GUATEMALA</td>
<td>J. D. Smith</td>
<td>5 Jun 1909</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td></td>
</tr>
<tr>
<td>Brickellia kellermanii</td>
<td>CALIFORNIA: DEP. BAJA VERAPAZ</td>
<td>W. A. Kellerman</td>
<td>5 Mar 1907</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td></td>
</tr>
<tr>
<td>Cakile chapmanii</td>
<td>MISSISSIPPI: HARRISON CO.</td>
<td>S. M. Tracy</td>
<td>29 May 1898</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td></td>
</tr>
<tr>
<td>Calamagrostis alaskana</td>
<td>ALASKA: Along Yukon River</td>
<td>F. Funston</td>
<td>Aug 1893</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td></td>
</tr>
<tr>
<td>Calamagrostis breweri</td>
<td>CALIFORNIA: Sierras</td>
<td>W. H. Brewer</td>
<td>21 Aug 1893</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td>(Designation based on Kearney's annotation, &quot;dupl. Type!&quot;)</td>
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<tr>
<td>Calamagrostis foliosa</td>
<td>CALIFORNIA: HUMBOLDT Co. Mattole District</td>
<td>H. N. Bolander</td>
<td>23 Jul 1893</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td>(Designation based on Kearney's annotation, &quot;dupl. Type!&quot;)</td>
</tr>
<tr>
<td>Calamagrostis inexpansa</td>
<td>NEW YORK: [YATES CO.]: Pen Yan</td>
<td>H. P. Sartwell</td>
<td>19 Aug 1893</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td>(Designation based on Kearney's annotation, &quot;dupl. Type!&quot;)</td>
</tr>
<tr>
<td>Calamagrostis insperata</td>
<td>CALIFORNIA: [CONTRA COSTA CO.]: Oakland</td>
<td>C. R. Orcutt</td>
<td>22 Aug 1893</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td></td>
</tr>
<tr>
<td>Calamagrostis leonmoni</td>
<td>IDAHO: [KOTENAI CO.]:</td>
<td>J. H. Sandberg, A. A. Heller, &amp; D. T. McDougall</td>
<td>1892</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td></td>
</tr>
<tr>
<td>Calamagrostis subflexuosa</td>
<td>CALIFORNIA: [CONTRA COSTA CO.]:</td>
<td>C. R. Orcutt</td>
<td>22 Aug 1893</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td>(Designation based on Kearney's annotation, &quot;dupl. Type!&quot;)</td>
</tr>
<tr>
<td>Calamagrostis vilfaeformis</td>
<td>CALIFORNIA: SAN DIEGO CO.:</td>
<td>C. R. Orcutt</td>
<td>22 Aug 1893</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td></td>
</tr>
<tr>
<td>Calliandra rhodocephala</td>
<td>NEW YORK: [YATES CO.]: Pen Yan</td>
<td>H. P. Sartwell</td>
<td>19 Aug 1893</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td>(Designation based on Kearney's annotation, &quot;dupl. Type!&quot;)</td>
</tr>
<tr>
<td>Carex trichina</td>
<td>MAINE: [AROOSTOCK CO.]:</td>
<td>E. F. Williams, J. F. Collins, &amp; M. L. Pernal — Plantae Exsiccateae Grayanae 110</td>
<td>1892</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td></td>
</tr>
<tr>
<td>Cassia depressa Pollard</td>
<td>FLORIDA: GADSDEN CO.</td>
<td>F. S. Earle, &amp; S. M. Tracy</td>
<td>5 Sep 1893</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td></td>
</tr>
<tr>
<td>Cassia multipinnata Pollard var. nashii</td>
<td>FLORIDA: GADSDEN CO.</td>
<td>F. S. Earle, &amp; S. M. Tracy</td>
<td>5 Sep 1893</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td></td>
</tr>
<tr>
<td>Celis helleri Small</td>
<td>TEXAS: BEXAR CO.:</td>
<td>A. A. Heller</td>
<td>17 Apr 1894</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td>(Designation based on Kearney's annotation, &quot;dupl. Type!&quot;)</td>
</tr>
<tr>
<td>Cerastium arvense var. webbii</td>
<td>OHIO: [CUYAHOGA CO.]:</td>
<td>O. E. Jennings</td>
<td>9 Apr 1894</td>
<td>C. C. Deam</td>
<td>ISOTYPE</td>
<td>(Designation based on Kearney's annotation, &quot;dupl. Type!&quot;)</td>
</tr>
</tbody>
</table>


TenENNESSEE: Hiawassee Valley, McFarland, Oct 1897, T. H. Kearney, Jr. s.n., Oct 1897, A. Ruth s.n., ISOTYPE. (Designation based on Kearney's annotation, "Dupl-type" [= Isotype], on the label).


TENNESSEE: [KNOX CO.]: Knoxville, 8 Sep 1890, T. H. Kearney, Jr. s.n., Oct 1897, A. Ruth s.n., ISOTYPE. (Designation based on Kearney's annotation, "Dupl-type" [= Isotype], on the label).


Guatemala: [DEP. BAJA VERAPAZ]: Volcan Agua, 15 Feb 1905, W. A. Kellerman 4395, ISOTYPE. Holotype US.


NEW MEXICO: [LINCOLN CO.]: Gray's Peak, Gray, 25 Jul 1900, F. S. Earle & Esther S. Earle 461, ISOTYPE.


Florida: [GADSDEN CO.]: River junction, 5 Sep 1895, G. V. Nash 2589, ISOTYPE. Holotype NY.

Crataegus contigua Sargent, Rhodora 5: 115. 1903. (4).

Vermont: [WINDSOR CO.]: [White River], Stockbridge, 1 Jun, 19 Sep 1901, W. W. Eggleston 2237, ISOTYPE. (Our specimen bears the notation, "Type Trees," on the label).


Ohio: RICHLAND CO.: Mansfield, May, Sep 1904, E. Wilkinson s.n., TOPOTYPE. (Our specimen bears the notation, "From the type tree," on the label).


Vermont: Bald Mt., Clarendon, 17 May, 5 Aug, Oct 1901, W. W. Eggleston 1789, ISOTYPE.


Ohio: RICHLAND CO.: Mansfield, May, Sep 1904, E. Wilkinson s.n., TOPOTYPE. (Our specimen bears the notation, "From the type tree," on the label).


Vermont: [BENNINGTON CO.]: West Rutland, Twin Mountain, 26 May, 6 Aug, 9 Oct 1901, W. W. Eggleston 2237, ISOTYPE. (Our specimen bears the notation, "Type Trees," on the label).

Crataegus paddockae Sargent, Rhodora 7: 202-203. 1905. (4).

Vermont: [CALEDONIA CO.]: Lyndonville, 29 May, 30, 14, 15 Sep 1903, W. W. Eggleston 3400, ISOTYPE. (Our specimen bears the notation, "Type Trees," on the label).


Ohio: RICHLAND CO.: Mansfield, May, Sep 1904, E. Wilkinson s.n., TOPOTYPE. (Our specimen bears the notation, "From the type tree," on the label).


Ohio: RICHLAND CO.: Mansfield, May, Sep 1904, E. Wilkinson s.n., TOPOTYPE. (Our specimen bears the notation, "From the type tree," on the label).


Vermont: [BENNINGTON CO.]: Bennington, 29 May 1900, 2 Aug, 27 Sep 1901, W. W. Eggleston 1804, ISOTYPE. (Our specimen bears the notation, "Type Trees," on the label).


Texas: [JEFF DAVIS CO.]: Davis Mountains, 23 Apr 1902, S. M. Tracy & F. S. Earle 172, ISOTYPE.

Crataegus wilkinsonii Ashe, Bot. Gaz. 35: 435. 1903. (1).

Ohio: RICHLAND CO.: Mansfield, May, Sep 1904, E. Wilkinson s.n., TOPOTYPE. (Our specimen bears the notation, "From the type tree," on the label).


Guatemala: DEP. BAJA VERAPAZ: Salamá, 2 Mar 1907, W. A. Kellerman 6499, ISOTYPE. Holotype US.


Florida: WAKULLA CO.: St. Mark's, 3 Sep 1895, G. V. Nash 2583, ISOTYPE. Also ISOTYPE NY.


Daucus carota L. f. fischeri Moldenke, Castanea 9: 55. 1944. (13).


LOWER CALIFORNIA: Socono, 27 Apr 1886, C. R. Orcutt 1830, ISOTYPE.

MISSISSIPPI: [OKTIBBEHA CO.]: Starkville, 1 Oct 1886, S. M. Tracy 5532, ISOTYPE.

LOWER CALIFORNIA: Socono, 27 Apr 1886, C. R. Orcutt 1330, ISOTYPE.

MISSISSIPPI: [OKTIBBEHA CO.]: Starkville, 1 Oct 1896, S. M. Tracy 5332, ISOTYPE.

TEXAS: [JEFF DAVIS CO.]: Davis Mountains, 28 Apr 1902, S. M. Tracy & F. S. Earle 320, ISOSYNTYPE.

TEXAS: [JEFF DAVIS CO.]: Limpia Canon, 26 Apr 1902, S. M. Tracy & F. S. Earle 279, ISOSYNTYPE.

Erigeron tracyi Greene, Pittonia 5: 58. 1903. (7A).
TEXAS: [JEFF DAVIS CO.]: Davis Mountains, 28 Apr 1902, S. M. Tracy & F. S. Earle 320, ISOSYNTYPE.

TEXAS: [JEFF DAVIS CO.]: Limpia Canon, 26 Apr 1902, S. M. Tracy & F. S. Earle 279, ISOSYNTYPE.

TEXAS: [JEFF DAVIS CO.]: Limpia Canon, 26 Apr 1902, S. M. Tracy & F. S. Earle 279, ISOSYNTYPE.

TEXAS: [JEFF DAVIS CO.]: Limpia Canon, 26 Apr 1902, S. M. Tracy & F. S. Earle 279, ISOSYNTYPE.
Gayophytum intermediate  

COLORADO: [OURAY CO.]: Ouray, 9 Sep 1901, L. M. Underwood & A. D. Selby 198, ISOTYPE.

Gerardia decemloba  
Greene, Pittonia 4: 51, pl. IX. 1899. (2C, 7B).


Gerardia divaricata  


Gerardia galvesiana  
Greene, Pittonia 5: 138. 1903. (7A).

TEXAS: [GALVESTON CO.]: Galveston Island, 24 Sep 1901, M. Tracy 7603, ISOTYPE.

Gerardia holmiana  
Greene, Pittonia 4: 52, pi. X. 1899. (2C, 7B).


Gerardia intermedium  

COLORADO: [OURAY CO.]: Ouray, 9 Sep 1901, L. M. Underwood & A. D. Selby 198, ISOTYPE.

Gerardia juncea  
Greene, Pittonia 4: 51, pl. IX. 1899. (2C, 7B).


Glottidium floridanum var. atrorubrum  

FLORIDA: HILLSBOROUGH CO.: Tampa, 20 Aug 1895, G. V. Nash 2415, ISOTYPE.

Gnaphalium brachyphyllum  

GUATEMALA: DEP. SOLOLA: Cerro Quemado, 8 Feb 1906, W. A. Kellerman 5301, ISOTYPE.

Gutierrezia fimbriata  
Greene, Pittonia 4: 56. 1899. (7A).

NEW MEIXCO: LINCOLN CO.: Gray, Aug 1898, J. Skehan 78, ISOSYNTYPE.

Helianthus brevifolius  

OHIO: LAKE CO.: Richmond, 1894, O. Hacker s.n., HOLOTYPE.

Helianthus illinoensis  
Glewson, Ohio Nat. 5: 214. 1904. (1).

ILLINOIS: [MASON CO.]: Havanna, 17 Aug 1904, H. A. Gleason s.n. ISOTYPE Ex Herb. GH. Holotype MO.

Helianthus kellermanni  

OHIO: FRANKLIN CO.: Columbus, 5 Oct 1898, W. A. Kellerman s.n. TOPOTYPE.

Helianthus laevigatus subsp. reindutus  

VIRGINIA: BATH CO.: Millboro, 1 Sep 1906, E. S. Steele s.n. ISOTYPE.

Helianthus occidentalis  


Helianthus severus  


Helianthus verticillatus  

TENNESSEE: CHESTER CO.: Henderson, Aug 1892, L. M. Bin s.n. [no. 288 in the publication], ISOTYPE. (Designation based on Kearney’s annotation, “Dupl. type!” [=Isotype], on the label).

Heliopsis pulchra  

MEXICO: CHIAPAS: Route 190, 5 mi n e Comitan, 25 Jun 1960, R. M. King 3049, ISOTYPE. Holotype TEX.

Hemizonia arida  


Hemizonia juncea  
Greene, Pittonia 4: 56. 1899. (7A).

NEW MEIXCO: LINCOLN CO.: Gray, Aug 1898, J. Skehan 78, ISOSYNTYPE.

Houstonia salina  

TEXAS: NEUCES CO.: Corpus Christi, 28-31 May 1894, A. A. Heller 1812, ISOTYPE.

Hudsonia ericoides var. leucantha  
Fernald, Rhodora 19: 76. 1917. (3).

CANADA: PRINCE EDWARD ISLAND: Bothwell, 6 Jul 1914, M. L. Fernald & H. St. John—Plantae Exsiccatae Grayanae 324, ISOTYPE.

Hydrangea cinerea  

TENNESSEE: White-CIiff Springs, 24 Jun 1890, F. L. Scribner s.n., 16 Jul 1894, T. H. Kearney, Jr. s.n. SYNTYPES. (Designation based on Kearney’s annotation, “Dupl. co-type!” [=Syntype], on the label).

Hypericum lobocarpum  

TENNESSEE: CARROLL CO.: Hollow Rock, yr. 1867 in fruit, 1886 in flower, A. Gattinger s.n., SYNTYPE.

**GUATEMALA:** DEP. SACATEPEQUEZ: Volcan Puego (Antigua), 20 Feb 1905, W. A. Kellerman 4548, ISOTYPE. Holotype US.


**NEW HAMPSHIRE:** [ROCKINGHAM CO.]: Kingston, Sep 1897, A. A. Eaton 942, ISOTYPE.


**NEW HAMPSHIRE:** [ROCKINGHAM CO.]: Kingston, Sep 1897, A. A. Eaton 942, ISOTYPE.

Iva• oraria Bartlett, Rhodora 8: 26. 1906. (3).

**MASSACHUSETTS:** [MIDDLESEX CO.]: Banks of the Charles River, Boston, 18 Sep 1895, H. Bartlett [356]—Platanus Exscissata Grayana 299, ISOTYPE.


**TENNESSEE:** [RUTHERFORD or DAVISSON CO.]: Lavergne, Jul 1894, A. Ruth 17; DAVIDSON CO.: Without locality, yr. 18—, A. Gattinger s.n. SYNTYPES.

**TEXAS:** KERR CO.: Kerrville, 12-19 Jun 1894, A. A. Heller 1857, ISOTYPE. Holotype DS.


**FLORIDA:** HILLSBOROUGH CO.: Tampa, 24 Aug 1895, G. V. Nash 2473, ISOTYPE. Holotype NY.


**FLORIDA:** MANATEE CO.: Palmetto, 21-23 Aug 1896, G. V. Nash 2430, ISOTYPE. Holotype NY.


**PENNSYLVANIA:** ALLEGHENY CO.: Pittsburgh, 2 Oct 1905, O. E. Jennings & Grace E. Kinzer s.n. ISOTYPE.


**CALIFORNIA:** NAP A CO.: Pope Creek, s Walters Spring, 29 May 1933, D. D. Keck 2338, ISOTYPE. Holotype DS.


**CALIFORNIA:** SAN LUIS OBISPO CO.: 5 mi e Cholame, summit of Polonio Pass, 9 Apr 1935, D. D. Keck & J. Clausen 3106, ISOTYPE. Holotype DS.

**CALIFORNIA:** LAKE CO.: 2.5 mi s Lakeport, 29 May 1933, D. D. Keck 2384, ISOTYPE. Holotype DS.

Lesquerella foliacea Greene, Pittonia 5: 134. 1903. (7A).


**OHIO:** COSHOCTON CO.: North Appalachian Experimental Watershed, near Coshoc-ton, 19 Sep 1942, H. N. Moldenke 14070a, HOLOTYPE. Also Isotype F, GH, MICH, NY, SMU, TEX, UC.


**MEXICO:** CHIHUAHUA: On route 16, ca. 5 mi e Ciudad Guerro, 21 Aug 1967, T. F. Stuessy 1054, ISOTYPE. Holotype US; also Isotypes F, GH, MICH, NY, SMU, TEX, UC.


**FLORIDA:** HILLSBOROUGH CO.: Tampa, 24 Aug 1895, G. V. Nash 2469, ISOTYPE. Holotype NY. (Designation based on Kearney's annotation, "Dupl Type!" [= Isotype], on the label).

**TENNESSEE:** [DAVIDSON CO.]: Nashville, n. d., A. Gattinger s.n. SYNTYPE.

**KENTUCKY:** BELL CO.: Cumberland River, Sep 1893, T. H. Kearney, Jr. 335, SYNTYPE.
No. 1 VASCULAR-PLANT TYPE SPECIMENS 31

MAINE: [KENNEBEC CO.]: Manchester, Jul 1896, F. L. Scribner s.n. ISOTYPE. (Designation based on Kearney's annotation, "Dipl. Type!" [= Isotype], on the label).

TENNESSEE: KNOX CO.: Knoxville, 9 Jul 1893, T. H. Kearney, Jr. s.n. SYNTYPE. Also Syntype NY. (Designation based on Kearney's annotation, "Dipl. Co-type!" [= Syntype], on the label).

FLORIDA: COLUMBIA CO.: Lake City, 29-31 Aug 1895, G. V. Nash 2500, ISOTYPE. Holotype NY. (Designation based on Kearney's annotation, "Dipl. Type!" [= Isotype], on the label).


NEW YORK: [PINE PLAINS, near Oneida Lake, n. d.], A. Gray s.n. ISOTYPE.


PLANTAGO rugelii var. fasciculata Moldenke, Castanea 9: 65. 1944. (13).

OHIO: [COSHOCTON CO.]: North Appalachian Experimental Watershed, near Coshocton, 8 Jul 1942, H. N. Moldenke 13107, HOLOTYPE. (Designation based on Kearney's annotation, "Type" [= Holotype], on the label).

FLORIDA: HILLSBOROUGH CO.: Tampa, 24 Aug 1895, G. V. Nash 2479, ISOSYNTYPE. Syntype NY.


GUATEMALA: [DEP. GUATEMALA]: Trapichite, 1 Jan 1907, W. A. Kellerman 6025, ISOTYPE. Holotype US.

Phoradendron multiflorum Trelease, Monogr. Phoradendron, 59, pi. 66, 67. 1916. (6).
GUATEMALA: [DEP. SACATEPEQUEZ]: Volcan Acatenango, 20 Feb 1905, W. A. Kellerman 8025, ISOTYPE. Holotype US.

Phoradendron vulcanicum Trelease, Monogr. Phoradendron, 77, pi. 99. 1916. (6).
GUATEMALA: [DEP. SACATEPEQUEZ]: Volcan Acatenango, 20 Feb 1905, W. A. Kellerman 8025, ISOTYPE. Holotype US.

FLORIDA: [LAKE CO.]: Eustis, yr. 1894, G. V. Nash 1170, HOLOTYPE. Isotypes NY. (Designation based on Kearney's annotation, "Type" [= Holotype], on the label).

SOUTH DAKOTA: [SPRING CREEK, 20 Aug 1901, T. A. Williams s.n. ISOTYPE.

Plantago rugelii var. fasciculata Moldenke, Castanea 9: 65. 1944. (13).
OHIO: [COSHOCTON CO.]: North Appalachian Experimental Watershed, near Coshocton, 8 Jul 1942, H. N. Moldenke 13107, HOLOTYPE.


FLORIDA: [LAKE CO.]: Eustis, yr. 1894, G. V. Nash 1434, HOLOTYPE. Isotype NY. (Designation based on Kearney's annotation, "Type" [= Holotype], on the label).

Polygonum amosissimum Michx. f. atlanticum Robinson, Rhodora 4: 72. 1902. (3).
MASSACHUSETTS: [DUKES CO.]: Edgartown, 10 Sep 1901, M. L. Fernald—Plantae Essictae Grayanae 68, ISOTYPE.

WASHINGTON: [PIERCE CO.]: Nesqually River near Longmire Springs, Mt. Rainer National Park, 18 Aug 1915, O. E. & Grace K. Jennings 9890, ISOTYPE. Holotype CM.


ALABAMA: [JEFFERSON CO.]: Red Mountain near Birmingham, 11 May 1898, C. Mohr s.n. ISOTYPE. (Designation based on Kearney’s annotation, “Dupl. Type!” [= Isotype], on the label).


ALABAMA: [JEFFERSON CO.]: Red Mountain near Birmingham, 11 May 1898, C. Mohr s.n. ISOTYPE. (Designation based on Kearney’s annotation, “Dupl. Type!” [= Isotype], on the label).


FLORIDA: ORANGE CO.: Sanford, 1 Aug 1895, G. V. Nash 2314, ISOSYNTYPE.


Saxifraga sullivantii Torrey & Gray, Fl. N. Am. 1: 575-576. 1840. (14). OHIO: [FRANKIN CO.]: Columbus, 1840, W. S. Sullivant s.n. ISOTYPE. Holotype GH; Isotype NY.

Scirpus debilis Pursh var. williamsii Fernald, Rhodora 3: 252. 1901. (3).

GUATEMALA: DEP. QUEZALTENANGO: Santa Maria, 5 Feb 1906, W. A. Kellerman 5895, ISOTYPE. Holotype F; also Isotype US.


GUATEMALA: DEP. ZACAPA: Gualán, 30 Dec 1905, W. A. Kellerman 5985, ISOTYPE. Holotype US; also Isotype MICH.


TEXAS: NEUCES CO.: Corpus Christi, 5 Jun 1894, A. A. Heller 1788, ISOTYPE.


TEXAS: KERR CO.: Kerrville, 14-21 May 1894, A. A. Heller 1751, ISOTYPE. (Designation based on Kearney’s annotation, “Dupl. Type!” [= Isotype], on the label).

Saxifraga sullivantii Torrey & Gray, Fl. N. Am. 1: 575-576. 1840. (14). OHIO: [HIGHLAND CO.]: Rocky Fork of Paint Creek], yr. 1840, W. S. Sullivant s.n. TOPOETYPE.

Saxifrages sullivantii Torrey & Gray, Fl. N. Am. 1: 575-576. 1840. (14). OHIO: [HIGHLAND CO.]: Rocky Fork of Paint Creek], yr. 1840, W. S. Sullivant s.n. TOPOETYPE.


GEORGIA: DEKLAB CO.: Little Stone Mountain—Tom George Creek, 7 Jul 1893, J. K. Small s.n. ISOTYPE. (Designation based on Kearney’s annotation, “Dupl. Type!” [= Isotype], on the label).


COLORADO: [CHAFFEE CO.]: Bear Creek, 30 Apr 1894, A. A. Heller 1679, ISOTYPE. Holotype NY.


PUNTILLA: HILLSBOROUGH CO.: Tampa, 21 Aug 1895, G. V. Nash 2472, ISOTYPE.

COLORADO: [OURAY CO.]: Bear Creek, 13 Sep 1891, L. M. Underwood & A. D. Selby 465, ISOSYNTYPE.


FLORIDA: [HILLSBOROUGH CO.]: Tampa, 24 Aug 1895, G. V. Nash 2472, ISOTYPE.


TEXAS: [KERR CO.]: Bear Creek, 30 Apr 1894, A. A. Heller 1679, ISOTYPE. Holotype NY. (Designation based on Kearney's annotation, "Dupl type" [=Isotype], on the label).


Solidago laeta Greene, Pittonia 5: 138-139. 1903. (7A).

TEXAS: [PARKER CO.]: Weatherford, 20 Oct 1902, S. M. Tracy 8137, ISOTYPE.

Solidago moseleyi Fernald, Rhodora 10: 93. 1908. (1).

OHIO: [ERIE CO.]: Oxford Prairie, 26 Sep 1908, E. L. Moseley s.n. TYPOTYPE. Holotype GH.


ALABAMA: [LEE CO.]: Auburn, 4 Oct 1897, F. S. Earle & C. F. Baker s.n., ISOTYPE.

Solidago venulosa Greene, Pittonia 5: 138. 1903. (7A).

COLORADO: [CHAFFEE CO.]: Bear Creek, 13 Sep 1891, L. M. Underwood & A. D. Selby 465, ISOSYNTYPE. Holotype NY.


COLORADO: [OURAY CO.]: Bear Creek, s Ouray, 10 Sep 1901, L. M. Underwood & A. D. Selby 275, ISOSYNTYPE.


COLORADO: [OURAY CO.]: Bear Creek, s Ouray, 10 Sep 1901, L. M. Underwood & A. D. Selby 275, ISOSYNTYPE.


MEXICO: [COAHUILA]: El Jimulco, near El Jimulco, 15 May 1941, L. R. Stanfor, K. L. Retherford, & R. D. Northcraft 115, ISOTYPE. Holotype NY. (Designation based on Kearney's annotation, "Type" [=Holotype], on the label).


TENNESSEE: KNOX CO.: Without locality, 9 Jul 1894, T. H. Kearney, Jr. s.n. SYNTYPES.


TENNESSEE: Colve CO: Wolf Creek Station, 6 Sep 1897, T. H. Kearney, Jr. 831, ISOTYPE.


COLORADO: [CHAFFEE CO.]: French Broad River near Wolf Creek, 2 Aug 1894, T. H. Kearney, Jr. s.n.; ALABAMA: [LEE CO.]: Auburn, 4 Oct 1897, F. S. Earle & C. F. Baker s.n., ISOTYPE.


TENNESSEE: Colve CO: Wolf Creek Station, 6 Sep 1897, T. H. Kearney, Jr. 831, ISOTYPE. Holotype NY.


COLORADO: [CHAFFEE CO.]: French Broad River near Wolf Creek, 2 Aug 1894, T. H. Kearney, Jr. s.n.; ALABAMA: [LEE CO.]: Auburn, 4 Oct 1897, F. S. Earle & C. F. Baker s.n., ISOTYPE.


MEXICO: [WAYSACION]: Eustis, yr. 1894, G. V. Nash 625, ISOTYPE. Holotype NY. (Designation based on Kearney's annotation, "Type" [=Holotype], on the label).

Tracaulon sagittatum (L.) Small f. subalbidum Moldenke, Castanea 9: 41. 1944. (13).

OHIO: [COUSHON]: North Appalachian Experimental Watershed, near Coosheon, 15 Aug 1942, H. N. Moldenke 18095, HOLOTYPE.


FLORIDA: [LAKE CO.]: Eustis, yr. 1894, G. V. Nash 1516, HOLOTYPE. Designation based on Kearney's annotation, "Type" [=Holotype], on the label).


OHIO: [COSHOCTON CO.]: North Appalachian Experimental Watershed, near Coshocton, 13 Aug 1942, H. N. Moldenke 18095, HOLOTYPE.

Tracaulon sagittatum (L.) Small f. subalbidum Moldenke, Castanea 9: 41. 1944. (13).

OHIO: [COSHOCTON CO.]: North Appalachian Experimental Watershed, near Coshocton, 13 Aug 1942, H. N. Moldenke 18095, HOLOTYPE.


FLORIDA: [LAKE CO.]: Eustis, yr. 1894, G. V. Nash 625, HOLOTYPE. Isotype NY. (Designation based on Kearney's annotation, "Type" [=Holotype], on the label).


OHIO: [COSHOCTON CO.]: North Appalachian Experimental Watershed, near Coshocton, 15 Aug 1942, H. N. Moldenke 18095, HOLOTYPE.


MISSISSIPPI: [HARRISON CO.]: Biloxi, 7 Oct 1896, T. H. Kearney, Jr. 831, SYNTYPE.
**Triphora trianthophora** (Sw.) Rydberg var. *schaffneri* Camp, *Rhodora* 42: 55. 1940. (1).


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**LITERATURE CITED**


Gilbert, B. D. 1901. Working list of North American pteridophytes north of Mexico, together with descriptions of a number of varieties not heretofore published. Publisher not listed, Utica, New York. 40 p.


Great Lakes Basin, Parts I and II. (Helen Hauck). April/June (No. 2) and July/September (No. 3) issues of Vol. 41 of Business and Technology Sources, Bulletin of the Business Information and Science and Technology Departments of the Cleveland Public Library, Cleveland, Ohio 44114. 1970. 8 p. each number. $.25 each number.

These two small issues contain a two-part bibliography of information on the Great Lakes. The bibliography is not annotated, but does attempt to cover a very wide range of topics relating to the Great Lakes. The material is set in type on good-quality paper.

Part I covers engineering aspects (beaches and harbors, soils, geology, sedimentation, and water levels), industrial and economic uses (fisheries, mineral and petroleum resources, recreation areas, transport and shipping), laws, meteorology (weather, evaporation, ice, storms, temperature, and seiches), and some subject bibliographies. Part II covers pollution (including its control and relation to wildlife), research, and water (analysis, pollution, resources, and as groundwater in areas adjacent to the lakes).

Despite the lack of annotation, these 16 pages present a striking survey of papers dealing with the Great Lakes, and especially with Lake Erie, from a variety of sources. References are taken from federal and several states’ publications, from scientific journals (including The Ohio Journal of Science), from reports from technological organizations, and from independent research sources. Because of the wide coverage of Great Lakes subjects considered, this two-part bibliography should be very useful to anyone concerned with the Great Lakes, especially with Lake Erie, particularly at this modest price.

Jane L. Forsyth