Cryptogams Collected by Thomas G. Lea from Indiana and Ohio, 1836-1842

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Introduction

A folder of specimens was received from Dr. Charles Reimer of the Academy of Natural Sciences of Philadelphia. A faded pencilled note on the folder said, "Within are Bryophytes collected by Thomas Lea. However, the majority may be Herb. of unknown collector." Another note on the folder expanded the message to indicate that there were algae and mosses collected in the Cincinnati region and there was the suggestion that Leo Lesquereux had written the names. The algae were all charophytes. There was only one moss, and it was the only specimen indicated as collected by T.G. Lea in the collection data with the material.

A sample of handwriting by Leo Lesquereux was kindly sent by Dr. Francis Hueber of the Smithsonian Institution. It was quite obvious that none of the writing on the packet, mounting sheets or notes accompanying some specimens belonged to Lesquereux. His handwriting had a distinct, neat appearance. The handwriting at hand had a strong right slant, indistinct letters, some noticeable peculiarities, and it was hard to read. Dr. Reimer obtained handwriting samples of T.G. Lea from a notebook of flowering dates at the Library of the Academy of Natural Sciences of Philadelphia. When compared with handwritten identifications and data, it was soon apparent that all of the handwriting was Lea's. This was corroborated by Prof. Ronald Stuckey of Ohio State University who is very familiar with Lea's handwriting, and Mr. John Frederick who verified that none of the writing was that of Leo Lesquereux. Notes with some of the specimens were similar to some found with flowering plants collected by T.G. Lea and mentioned in a publication by Dr. E. Lucy Braun (1). The collecting sites closely corresponded to some mentioned by Dr. Braun, too. Upon reading Lea's notes, it is clear that Dr. John Torrey identified most of the specimens. The identifications were sometimes conveyed to Lea by an associate of Torrey and friend of Lea, Mr. John Carey. Dr. Torrey was uncertain about some of the identifications, so Lea sent the material to E. Doubleday (Kew Gardens, Great Britain). No changes were made in identifications, though. Perhaps an answer did not come before Lea's death. Evidently news was slow in coming judging from a letter (also supplied from the Library of the Academy of Natural Sciences of Philadelphia) from Lea to M.J. Berkeley of Great Britain. Some fungi are mentioned which Lea had sent to Doubleday with the hope that W.J. Hooker would see them. Mr. Lea had not heard from him and in his *Catalogue of Plants* (2) cites Rev. Berkeley as having identified them. W.J. Hooker is credited with authenticating the species of mosses. He may have seen the charophytes, too, but Torrey's identifications were not changed. Dr. Torrey became interested in the algae with the help of Lewis D. Schweinitz and planned to include them in a flora of North America. Unfortunately, it was never finished.

Specimens Seen

All specimens can be found in the Academy of Natural Sciences of Philadelphia. They were collected in the vicinity of Cincinnati, Ohio, by Thomas G. Lea except one collected in Indiana. The identifications by the author and collection data are given in Table 1.

It is interesting that the identification of the moss in Packet 9 was originally *Hypnum gracile* Br. and Sch. [now placed in synonomy with *Thuidium microphyllum* (Sw.) Best published in 1843]. Lea died in 1844, so he must have written the data on the moss

TABLE 1. Identifications and collection data.

Packet	Identification	Col. Date	Habitat
1	*Nitella acuminata* f. *subglomerata* (A. Br.) R.D.W.	Sept. 5, 1837	Toward Ludlow's in small pond near canal bank
2	Same	Sept. 17, 1836	Este's "bog", ditch, north end
3	*Chara contraria* A. Br.	June 12, 1839	Este's "bog", ditch, west side
4	*Nitella acuminata* f. *subglomerata* (A. Br.) R.D.W.	Aug. 12, 1837	Pond near canal bank near Ludlow's
5	*Chara contraria* A. Br.	July, 1842	Este's "bog", ditch west side
6	*Nitella acuminata* A. Br. ex Wallm.	Oct. 12, 1840	Este's "bog", north end in slow water
7	*Chara zeylanica* f. *elegans* (A. Br. ex T.F.A.) H. & J. Gr.	Sept. 14, 1838	Ohio River below Ludlow's near shore
7A, B	*Chara contraria* A. Br.	Sept. 1, 1838	Bog rivulet, Mr. Barnes, Indiana
8	*Chara gymnopitys* A. Br.	Oct. 12, 1840	Este's "bog", upper end near ditch
9	*Thuidium microphyllum* (Sw.) Best	None given	None given

packet during the 1843 to 1844 period. The Cincinnati collection sites can be located on Map 1.

A hand-written copy of Lea's *Catalogue of Plants* was found at the Library of the Academy of Natural Sciences of Philadelphia. At the end of it, some additions were written in pencil as follows:

"Characeae
Nitella nidifica Ag.
Chara vulgaris Linn.
Chara aspera Willd."

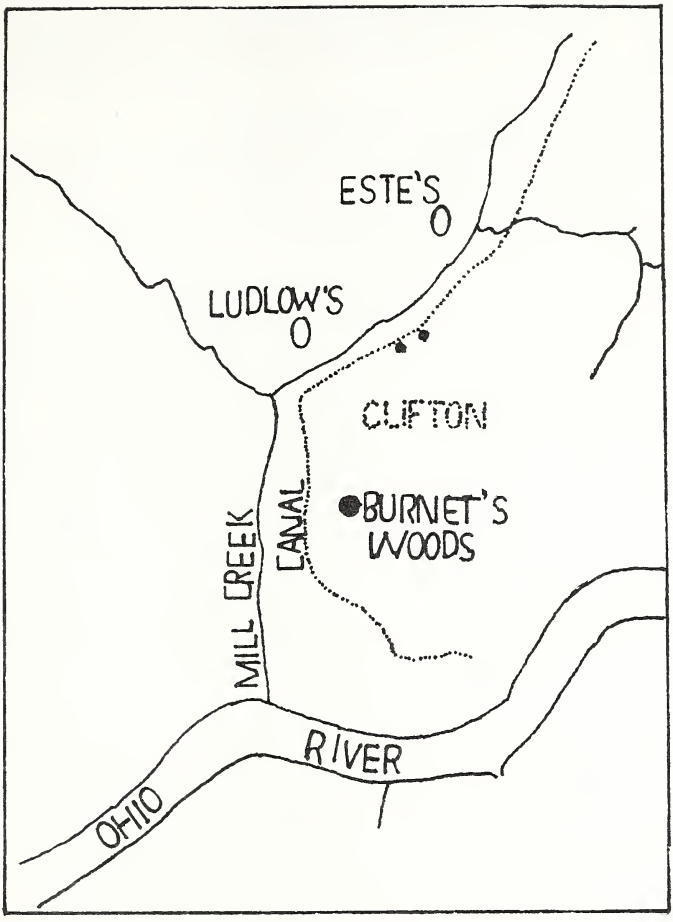
These are the same species names given originally to the specimens of Characeae reported here. Why they do not appear in the printed version published posthumously can only be surmised.

Habitat

In a geological report on Ohio by John L. Riddell (3), the Cincinnati area is classified as the Blue Limestone District. He states, "The composition of the most prevalent soil in the district may be known by studying the nature of the limestone, and of the interlaminar marl or shale for no one who scrutinizes the subject with philosophic care can doubt its having been produced and its being now in progress of production, by the decay or disintegration of those strata - - - - here the surface being generally inclined and the rock either superficial or not far beneath it, as fresh portions of limestone or marl crumble to pieces; they are transported by showers of rain and mingled with the soil down the declivity."

An analysis of the soil by John Locke revealed that from one hundred grains of limestone from the hills of Cincinnati, the following ingredients were yielded; carbonate of lime, 90.93 grains; peroxide of iron, 3.15 grains; matter soluble in muratic acid, 1.80 grains; carbonate of magnesia, 1.11 grains; silex from solution, 0.77 grains; water expelled by red heat, 1.13 grains; loss, 1.11.

Farther on in his report, Dr. Riddell states, "I am indebted to my friend, D. Lapham, Esq. for samples of yellowish marly clay taken from the diluvial deposits of Mill Creek Valley. Its color is brownish yellow and it consists essentially of quartrose aluminous



MAP 1. Orientation of collecting sites in Cincinnati, Ohio (adapted from Braun (1)).

and limestone particles of impalpable fineness." It has been used to make very durable brick.

The Cincinnati sites where specimens in this study were collected were located in the Mill Creek Valley near Mill Creek or the canal or near the Ohio River. Dr. E. Lucy Braun (1) in 1934 said that during Lea's time, the area looked like this, "The bordering hills were wooded or farm land, and the broad valley of Mill Creek, now a factory section for twelve miles of its length, was partly farm, but largely wooded or swamp land." Dr. Braun described Este's as, "the most distant locality in the Mill Creek Valley visited by Lea. It lay opposite the present site of Ivorydale to the northeast of Winton Place. Here the labels indicate a variety of habitats- ponds, ditches, bog, prairie bog, prairie and hill woods. - - - - Este's is on the west side of Mill Creek in a sandy glacial soil area. - - - - The 'bog' may have been a true bog or swamp. In it were *Rhus vernix*, *Dulichium arundinaceum* and *Carex rostrata*, plants of northern range which distinctly indicate the presence here of a boreal, probably bog, relic colony."

Ludlow's was described by Dr. Braun as on the west side of Mill Creek about two miles below Este's. She mentioned several large springs emerging on the property. Whether these produced the "ponds" mentioned by Lea is not known. Dr. Braun commented after mentioning the springs, "nowhere can we find its counterpart today." The Ohio River site has seen changes with the passing years also.

In summary, the Cincinnati area studied by Lea had changed dramatically by the time Dr. Braun wrote her account of Lea's herbarium. She says, "The rich collecting grounds of 1840 are the factory sites of today. Habitats, briefly described in words, and amply demonstrated by groups of specimens, are utterly destroyed and with them their characteristic flora."

One charophyte came from Indiana. The locality was hard to read on the note accompanying 1C-84 (No. 7A in this study), but Lea's archives helped verify the locality. They contained a letter (at the Library of the Academy of Natural Sciences of Philadelphia) from T.G. Lea to John Carey of New York, February 14, 1839 (letterbook) which mentions a packet of plants sent for identification. Many of the plants were collected in Indiana. Lea received an answer August 9, 1839. The citation, "Carey letter Aug/ 39" occurs on a note accompanying Lea's specimen 1C-84. The note quotes from the letter as follows, "84 looks like *C. vulgaris* but Dr. Torrey was unwilling to give a certain species"

Also from Lea's letterbook in the Lea collection, a loose note mentions the letter from Carey in which no mention was made of numbers 76-80 from Indiana also sent to Torrey. Number 84 is close to this sequence. Credence is accordingly given to the Indiana locality for specimen number 84 although, purportedly, all specimens in the folder were collected in the Cincinnati, Ohio, area.

These letters also substantiate that the specimens reported here were those of T.G. Lea and that John Torrey identified them.

Conclusions

For the few collections of charophytes represented here, there are two genera and four species showing a rich charophyte flora for a small collecting area. The specimens are interesting from the standpoint of their age, the supplemental value they lend to the published work of Lea and the well-known botanists involved. Neither *Hypnum gracile* now transferred to *Thuidium microphyllum* nor any of the charophytes were included in Lea's (2) printed *Catalogue of Plants*.

Acknowledgments

This is a note of appreciation to Dr. Charles Reimer and Ms. Carol M. Spawn of the Academy of Natural Sciences of Philadelphia, also Mr. John Frederick and Prof. Ronald Stuckey of Ohio State University and Dr. Francis Hueber of the Smithsonian Institution for many favors.

Literature Cited

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3. Riddell, John L. 1837. Report of a special committee to report on the method of obtaining a complete Geological Survey of the state. Ohio Executive Documents No. 60. 30 p.