

## EMMA JANE COLE, WEST MICHIGAN'S LATE-19TH CENTURY BOTANIST: A BIOGRAPHICAL SKETCH

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### ABSTRACT

Emma J. Cole (1845–1910) published *Grand Rapids Flora* in 1901, which catalogued the vascular plants growing in the vicinity of Grand Rapids, Michigan. As a teacher of botany at Central High School, and as the curator of the herbarium of the Kent Scientific Institute, she saw the need for an up-to-date account of the plants of the area to engage her students in the study of systematic botany. She engaged in intensive botanical collecting during the years 1892 to 1899 by horse and buggy, and, with the help and encouragement of various high school students of botany, former teachers, and some local botanical enthusiasts, she was able to compile a thorough record of the plant species growing without cultivation within 16¼ townships, comprising 585 square miles, centered on Grand Rapids. Throughout her research, she was in correspondence with B. L. Robinson and M. L. Fernald, both of the Gray Herbarium at Harvard University, who were then preparing a new 7th edition of *Gray's Manual of Botany*, as well as with C. F. Wheeler and W. J. Beal, who were botanists at Michigan Agricultural College (now Michigan State University) engaged in research on the flora of Michigan. She not only had a significant impact on botany in West Michigan, but became a cherished mentor to many students. When Cole's *Grand Rapids Flora* was completed, she turned her attention to studies of *Crataegus* (hawthorns), collaborating in those studies with C. S. Sargent, Director of the Arnold Arboretum at Harvard University. She also travelled widely in northeastern and western North America, botanized in Europe on a three-and-a-half-month trip, and visited Cuba, collecting botanical specimens all along the way. By her passion and pursuit of a professional vocation in science during a time when it was very difficult for women to do so, she inspired, and continues to inspire, botanists both amateur and professional, who love the natural world and wish to preserve it. In 2007, she was inducted into the Michigan Women's Hall of Fame, recognized for her life's work and her contributions to science and education. And her *Grand Rapids Flora* continues to provide a critical historical context and inspiration for us in our pursuit of knowledge of the Grand Rapids flora in the twenty-first century.

KEYWORDS: Biodiversity, biography, botanical history, Emma Cole, flora, Michigan flora, Grand Rapids Public Museum, herbarium, Kent Scientific Institute, plant specimens

### INTRODUCTION

In the spring of 1901, a new botanical work, *Grand Rapids Flora: A Catalogue of the Flowering Plants and Ferns Growing Without Cultivation in the Vicinity of Grand Rapids, Michigan* (hereinafter "*Flora*"), was published by

Emma J. Cole (1901). The *Flora* was widely distributed and well received nationally and internationally. Throughout her research on the *Flora* Emma corresponded with such distinguished botanists as W. J. Beal and C. F. Wheeler of Michigan Agricultural College (officially Agricultural College of the State of Michigan, now Michigan State University), B. L. Robinson and M. L. Fernald of the Gray Herbarium of Harvard University, and C. S. Sargent of the Arnold Arboretum at Harvard University. Sargent even named a species of hawthorn for her (*Crataegus coleae*), adding this delightful line at the end of the article in which the species was first described: "It is a pleasure to associate with this handsome shrub the name of its discoverer, Miss Emma J. Cole of Grand Rapids, Michigan, the author of *The Grand Rapids Flora*, and a careful and industrious student of the plants of central Michigan, where she has made a number of other important discoveries" (Sargent 1902a). This important botanical reference remains the most recent comprehensive account of the plants specific to the greater Grand Rapids area, and one that is still consulted by those with interests in local native habitats, the historical status of today's State-listed rare and endangered plants, and the flora of the region in general (Crow 2017). Prompted by their use of Cole's valuable *Flora*, David Warners and Garrett Crow of Calvin College, in collaboration with Bradford Slaughter of Orbis Environmental Consulting, initiated a project centered at the Calvin College Herbarium to reexamine the flora of the Grand Rapids area, with the intent of 1) identifying and accessing specific areas studied by Cole, 2) determining the impact of development on the flora as a whole, 3) reassessing specific localities Cole regarded as botanically significant, 4) discovering and inventorying other ecologically interesting sites within the area of Cole's *Flora*, and 5) determining the current status of the rare plants tracked by Michigan Natural Features Inventory (2016) that were listed in Cole's *Flora*.

Fortunately, the desire by the botanists to know more about the author of the *Flora* intersected with an effort by Julie Stivers to continue her biographical investigations on Emma Cole. Stivers (2007) had prepared the historical documentation for the nomination of Miss Cole submitted by the Greater Grand Rapids Women's History Council to receive long-overdue statewide recognition for her contributions to education and science. Although highly praised in her time for her 26-year teaching career, her work merited re-examination and honor for its outstanding and pioneering contributions to science. On October 17, 2007, the 19th century Grand Rapids botanist and teacher Emma Jane Cole was inducted into the Michigan Women's Hall of Fame for her achievements in the field of science and technology (Michigan Women's Hall of Fame 2007; Stivers 2007).

In an editor's footnote to Cole's (1962) posthumously published article on Green Dragon, *Arisaema dracontium*, the late Dr. Edward G. Voss, author of the three-volume *Michigan Flora* (Voss 1972, 1985, 1996) and first editor of *The Michigan Botanist* (now *The Great Lakes Botanist*), noted that "Miss Emma J. Cole, author of the remarkably fine *Grand Rapids Flora* . . . evidently influenced a large number of people in the study of botany, and she will surely be worthy of a biographical treatment one day in THE MICHIGAN BOTANIST." We here present that long-awaited biography of Emma J. Cole (Figure 1) along with a col-

lection of letters between Emma Cole and various correspondents (Appendices 1–4) that illuminate important aspects of her life and work.

### THE EARLY YEARS

Emma Cole was born on January 23, 1845, in Milan, Ohio (Anonymous 1910). She and her family moved to Vergennes Township, about 11 miles east of Grand Rapids, sometime between 1855, when their name does not yet appear on the township plat map, and 1859, when her father Andrew Cole is listed as a Justice of the Peace (Chapman 1881). She attended Lowell Union School and Grand Rapids High School. She returned home to teach in the Vergennes district school for 4 years, while at the same time taking over the household duties for her invalid mother. She then taught in Union School in Lowell from 1869 to 1872, and afterwards at Greenville High School until 1876 (Beers 1900; Greeson 1910).

Emma had two brothers, John and Hugh, and a sister, Mary Cole Althouse, who died in 1873 at the young age of 25, as noted on her headstone at the Vergennes graveyard. After her father died in 1875 (Chapman 1881), Emma Cole, at the age of 31, left the safety and security of her rural life and, using her savings from teaching, enrolled in Cornell University in upstate New York in 1876 (Beers 1900; Greeson 1910). Cornell was chartered in 1865 as both a private university and as New York State's land-grant institution and Agricultural Experiment Station, to provide education in the arts, sciences, and literature as well as free tuition for students who pursued the full course in agriculture (Hewett 1905). Initially an all-male institution, Cornell matriculated its first class in 1868 and started admitting women in 1870—over the protests of many male undergraduates and faculty (Hewett 1905; Bishop 1962). Yet, on the day the University was formally opened, Henry W. Sage told the President: “When you are ready to carry out the idea of educating young women as thoroughly as young men, I will provide the endowment to enable you to do so” (Hewett 1905; Bishop 1862). By 1899, 367 female students were enrolled (Bishop 1962).

In the fall of 1877, just as Emma was to begin her sophomore year, her mother, Jerusha Cole, died, and she returned home (Anonymous 1877). She went back to Cornell in the fall of 1879 to continue her studies in botany and other subjects. Her transcripts from Cornell survive and reflect high marks through June 1880. The transcript entries end there, which leads us to believe that she left Cornell at the end of the 1879–80 academic year without having completed a degree (Cornell University 1993). She returned to Grand Rapids and joined the faculty at Central High School in 1881, where she taught for 26 years (Greeson 1910). The school was then located at Lyon and Barclay where Grand Rapids Community College now stands.

In her early days when she was assigned to the teaching of history, she wasn't a standout, according to a tribute written after her death by the Principal of Central High, William Greeson. But after taking over the botany department, she was often described as one of the most popular teachers at the high school (Greeson 1910).



FIGURE 1. Emma J. Cole as she appeared in the 1895 Yearbook, Central High School, Grand Rapids, Michigan. Source: Grand Rapids History & Special Collections, Archives, Grand Rapids Public Library, Grand Rapids, MI. Date of photo uncertain, possibly 1881 when she began teaching, as she appears young; the same photograph was used in all yearbooks seen.

Central High had for many years also housed the collections of the Kent Scientific Institute (KSI), thereby giving teachers access to the KSI natural history collections and library for instructional purposes and providing space for KSI's public meetings (Baxter 1891; Goss 1906). KSI, the precursor to today's Grand Rapids Public Museum, was established in January 1868 and operated under an agreement with the Board of Education of Grand Rapids; it was quickly earning a national reputation for its extensive collection and scientific undertakings. In his *History of the City of Grand Rapids, Michigan*, Albert Baxter (1891) wrote that KSI "has grown to be among the finest scientific collections in the West."

Emma was among the first female members of the Kent Scientific Institute. The minutes for November 6, 1891, mention her as chairman of the Botany Committee, and the Treasurer's book lists her faithful dues payments through 1908. In the meeting of February 2, 1900, she was elected a Vice President of the organization. Although two other women's names appear in previous governing lists in KSI annual reports, it is almost certain that Emma was the first woman to be paid for anything by the Institute. The governing and operating staff of the Institute served without salary, according to early records, but in the fall of 1891, the KSI Board of Directors voted to pay for Emma Cole's board during summers, thereby enabling her to complete the mounting and arranging of botanical material (Anonymous 1891). For an organization whose budget at the time seems to have averaged around \$100 annually, a stipend of \$10 each summer was a significant vote of confidence by her peers. They also voted to pay for all supplies required for mounting and processing the specimens for the Institute's herbarium (Anonymous 1892).

#### PREPARATION OF THE *FLORA*

Soon after Emma Cole began covering the botany curriculum at Central High School, she recognized the great need for an up-to-date account of the plants growing in the region of Grand Rapids. Wanting to engage her students in the study of systematic botany, Emma launched her *Flora* project in earnest in 1890. She envisioned a comprehensive listing of all the vascular plants growing within the city and the 16¼ adjacent townships (Figure 2), comprising 585 square miles. But even more, she endeavored to include information about blooming time, habitat preferences, and occurrences of uncommon or rare plants, especially those vulnerable to impacts of development. She recorded those plants that were adventive, or were aliens becoming established and even weedy (several of which would turn out to be first reports for the State), or were escapees from gardens. She described several especially rich and interesting natural habitats and localities, such as areas predominantly of beech and maple forests, or wooded lowlands of Black Ash (*Fraxinus nigra*), Red Maple (*Acer rubrum*) Bur Oak (*Quercus macrocarpa*), Swamp White Oak (*Q. bicolor*), Sycamore (*Platanus occidentalis*), and Black Willow (*Salix nigra*). She noted areas of oak openings near the city and sites with rather large groves of White Pine (*Pinus strobus*), lamenting the widespread cutting of the latter for timber. Specific areas were described floristically, including the Saddle-bag Swamp Region, the Lamberton Lake Region, the Reed's Lake Region, the Crooked Lake (Dean Lake) Region, the Burton Avenue Swamp (dubbed the Orchid Swamp), the Pine Hill white sand bluffs along the Thornapple River, the Mill Creek Woods, the Plainfield Village Bluffs along the Grand River, the Zeeland Swamp stretching from Hudsonville through Zeeland, and Georgetown's Cedar Swamp.

Cole also enumerated species that she viewed as disappearing, those apparently already lost from the flora, and those species that are well-known from the Lake Michigan shores but occur only occasionally in the *Flora* area. She also

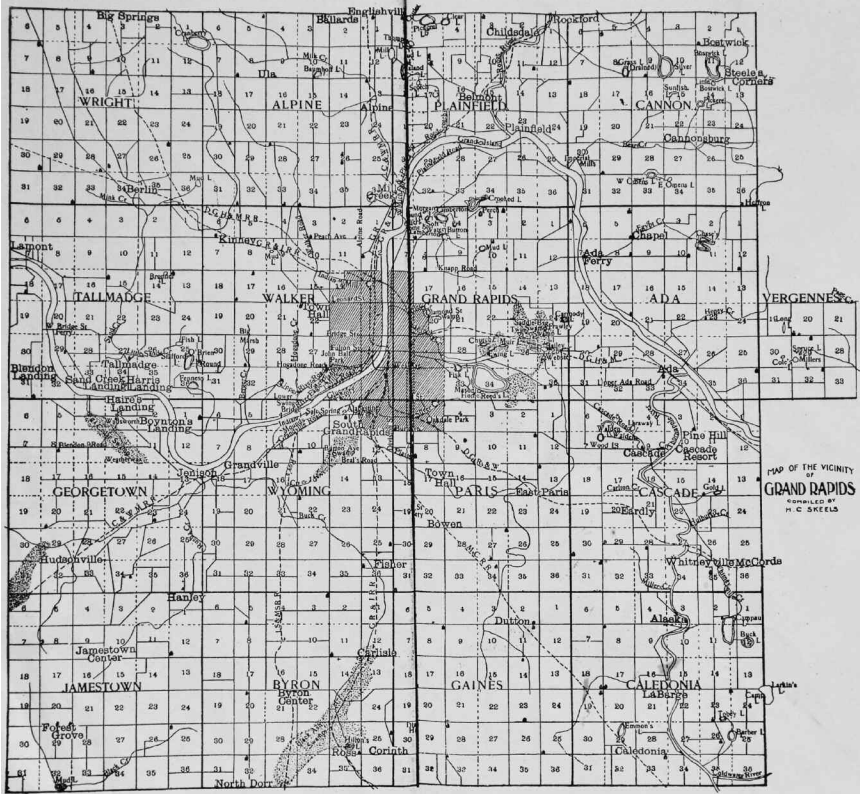


FIGURE 2. The geographical area covered by Cole's *Grand Rapids Flora* prepared by Homer C. Skeels, a former student of Miss Cole, was included in the front of the *Flora*. The four westernmost townships occur in Ottawa County, all others belong to Kent County; extension eastward of her map includes 9 Sections of Vergennes Township that surround Cole's family home.

listed those reported in her *Flora* that were then known from nowhere else in Michigan.

Decades after her death, Central High botany teacher Arlene Whittome (1941) wrote in a loving tribute that Emma spent "six summers in the 1890s [when she] frequently drove a horse and buggy to her collecting areas, especially to her many secret gardens which no one but herself ever saw."

In addition to teaching botany, serving as the curator of KSI's herbarium was of enormous value to Emma. Although she began collecting as early as 1873 in the vicinity of her rural family home in Vergennes, no more than 38 of her surviving specimens were collected before 1892. Over 5000 specimens that she and colleagues collected (including more than 2600 collected by Emma herself) can still be found in various herbaria, especially those of the KSI collection housed at the University of Michigan Herbarium (MICH) through a permanent loan agreement in 1974 with the Grand Rapids Public Museum (Voss 1978); addi-

tional specimens are at the Michigan State University Herbarium (MSC), the Albion College Herbarium (ALBC), and other herbaria. The bulk of her specimens were collected between 1890, when she embarked on her project, and 1899, but numerous additional collections were made through 1908 (University of Michigan Museums 2016; Crow unpublished data 2018). A comprehensive updated checklist of all the species covered in Cole's *Flora* and the specimens documenting it is available in Crow (2017).

Emma Cole's exuberance about all things botanical is clearly evidenced by the impact she had on students. Several of them developed a love of botanizing during their high school days and remained keen collectors, contributing significantly to her *Flora* project even beyond their graduation. Particularly noteworthy is a group of students in the class of 1893. These included Homer C. Skeels, Jennie Shaddick, W. Earle Mulliken, Burton E. Livingston, Ralph E. Matteson, Grace Fyfe, and F. P. Daniels. Other Central High alumni who contributed to the *Flora* included S. Owen Livingston and Luther S. Livingston (both brothers to Burton).

A number of Emma's students went on to distinguished careers in science. Homer Skeels and Jennie Shaddick did extensive collecting in 1895 and 1896 for the *Flora* project during the years in which Homer studied botany at Michigan Agricultural College, which provided Emma with much information to describe a very rich woods referred to as Mill Creek Woods (Cole 1901). C. F. Wheeler wrote Emma in 1893 (see Appendix 4, Letter 1) that "Homer Skeels is a good student. We allowed him to enter in advance in botany. He ranked no. 1 in the final Examination." Homer married Jennie and moved on to a position with the US Department of Agriculture in Washington, D.C., in the Office of Foreign Seed and Plant Introduction, and became an expert at seed identification. Burton Livingston also studied botany, receiving a BA from the University of Michigan and a PhD from the University of Chicago; he then conducted research on the physiological ecology of desert plants in Arizona at the Desert Laboratory of the Carnegie Institution of Washington and ultimately obtained a faculty position in plant physiology at Johns Hopkins University (Crow 2017). Ever the mentor, Emma Cole even loaned Earle Mulliken \$100 to enable him to further his studies in the area of ornithology at the University of California at Berkeley, as evidenced by an entry in her will: "cancel note of \$100 held against Earle Mulliken of Berkeley, California, if the same shall remain unpaid at the time he graduates from the University of California" (Cole 1910). She acknowledges in the Introduction to the *Flora* having consulted the collections of Leon J. Cole, a presumed young relative who hailed from New York State and was studying agriculture at Michigan Agricultural College (Cole 1901). Leon became good friends with Earle Mulliken on his visits to Grand Rapids, where they collected plants together. Their passion for natural history is self-evident. The two became co-managing editors of the fledgling *Bulletin of the Michigan Ornithology Club* (Anonymous 1897a, 1898). Leon Cole ultimately received a PhD from Harvard University and became the first chair of the Department of Experimental Breeding (now the Department of Genetics) at the University of Wisconsin-Madison (University of Wisconsin-Madison 2018). For additional biographical information on these individuals, see Crow (2017).

In 1896, Emma Cole played the key role in the establishment of a Grand Rapids Botanical Club in connection with KSI (Botanical Club minutes June–July 1896, University of Michigan Herbarium Archives). This further fostered an interest in the collecting of specimens to contribute to the KSI Herbarium as well as the *Flora* project. Others in the area with a keen interest in natural history began developing private collections that ultimately became part of the KSI Herbarium or herbaria of other institutions; these included specimens of Hattie Bailey (Pieters), the biology and zoology teacher at Central High, of Mary Fallass (from whom Emma rented a room near Central High) and her daughter Florence Fallass, of Charles W. Fallass, Hermann Hyser, and Miss Annah Clark, Miss Mary Clark, and of Central High's principal, Mrs. Hulst (Anonymous 1895, 1896, 1897b; Cole 1901; Crow 2017). C. F. Wheeler, a botanist at Michigan Agricultural College and a coauthor of *Michigan Flora* (Beal and Wheeler 1893), took a great deal of interest in Cole's floristic project and offered to identify or confirm Cole's specimens of difficult groups, especially *Carex* and *Potamogeton* (Cole 1901); extant specimens collected by Wheeler at the Michigan State University Herbarium (MSC) and the University of Michigan Herbarium (MICH) indicate that he came to Grand Rapids to collect sedges (*Carex*) in some of the favored spots himself.

By 1900, Emma Cole was at a stage where her energies were concentrated on writing the manuscript of the *Flora*. Needless to say, production of the manuscript differed considerably from the process today. The earliest manuscripts by the authors were prepared on typewriters—a device hardly known to today's students. However Emma's manuscript predated the ready availability of typewriters and was, of necessity, handwritten. This was especially problematic, as her handwriting was particularly difficult to read (personal experience of both authors). Furthermore, she had to have portions of the manuscript set in lead type by her printer before she could send page-proofs to reviewers for their comments. To facilitate the correct spelling of scientific names for her typesetter she “cut up Mich. Floras [Beal & Wheeler 1893] and pasted the names on cards to aid my printer, as my writing is not legable [sic] at best” (Cole letter to her proofreader, Luther S. Livingston, March 18, 1900, Appendix 2, Letter 3).

To assure that her scholarly work was of the highest quality, Emma Cole frequently communicated with Dr. Benjamin Lincoln Robinson, Director of the Gray Herbarium, Harvard University, and his (then) young assistant, Merritt Lyndon Fernald, who were in the midst of writing the 7th edition of *Gray's Manual of Botany* (Robinson and Fernald 1908); Fernald was to ultimately produce the highly venerated 8th edition of *Gray's Manual of Botany* (Fernald 1950). Not only did they provide advice and commentary in response to her questions of nomenclature and species identity—Cole (1901) specifically acknowledged Fernald's contribution to her treatment of the notoriously difficult genus of Asteraceae, *Antennaria* (pussytoes)—but Fernald even offered to read the page-proof of the entire manuscript, including the index (Crow 2017). Numerous letters from Emma Cole to both Robinson and Fernald are preserved in the Archives of the Gray Herbarium at Harvard University; these letters open a fascinating window (though only one-way) into the production of Cole's *Flora* (see Appendix 1 for a complete transcription of these letters).

Another person who was key to the completion of her *Flora* was her trusted



proofreader, Luther S. Livingston, an alumnus of Central High, class of 1881, the same year Emma Cole began her teaching career (Anonymous 1896; Stivers 2007; Crow 2017). We speculate that when Luther returned to Grand Rapids to attend a 15-year class reunion, he may have offered to serve as a proofreader when she reached the stage of generating the typeset proof sheets. In a letter written to him on Christmas Eve of 1899, she wrote: “The ‘Flora’ I hope will soon be in the hands of a publisher and I have in kindly remembrance ‘a promise’ that if possible you would assist me in the looking over the proof. Are you too busy to do so? It will come in 16 pages or its equivalent about once in two weeks or so. I shall esteem it a great favor if you can do so as I have never read proof” (Cole letter, Dec. 24, 1899, Appendix 2, Letter 1).

A fascinating piece was published in the 1896 yearbook updating Luther Livingston’s activities during the 15 years since his graduation (undoubtedly submitted by Luther). For a period he was employed by Pitcher & Manda Nurseries in Short Hills, New Jersey, where he was appreciated for his ability to write concise, accurate descriptions for their catalogs. His employers then sent him on an 18-month expedition to Colombia in South America as a collector of orchids, from where he sent back thousands of live plants for sale in their greenhouse operation (Anonymous 1896; Crow 2017). Later he became a highly esteemed rare book dealer in New York City. Luther’s skills as a proofreader came from his extensive experience in preparing detailed rare book catalogs for his company, Dodd & Livingston. For additional biographical information see Crow (2017) and Winship (1914).

Remarkably, letters from Emma Cole to Luther Livingston relating to the production and proofreading of the *Flora* were discovered in the Archives of the Gray Herbarium, Harvard University. Why at Harvard, if he was a book dealer in New York City? It turns out that Luther was so esteemed in the world of rare books that he received and accepted an offer to become the first librarian of the Harry Elkins Widener Memorial Collection in the Harvard College Library at the Widener family’s request. Sadly, he passed away in 1914, within six months after beginning this new career. His wife, Flora Virginia Livingston, was named Assistant Librarian of the Widener Collection following his death and later promoted to Librarian (Social Networks and Archival Context 2017). Because of his life-long passion for botany, those letters to Luther were preserved in the Gray Herbarium Archives. Since they shed considerable light on the production phase of Emma Cole’s *Flora*, we have transcribed and included here her letters to her valued proofreader (see Appendix 2). Also included is the single surviving missive from Luther to Emma Cole (Livingston’s notes, June 1900, referred to in Cole’s letter back to Luther Livingston dated June 15, 1900, Appendix 2, following Letter 7). Evidently, the process of proofing prompted a number of botanical memories from his youth, and he made notes on several plants and on those specific recollections; several of these comments were incorporated by Emma into her *Flora*. A sample from his notes regarding the orchid *Arethusa bulbosa* (*Arethusa*) along with information squeezed into Cole’s text subsequent to the typeset proof sheet are reproduced in Table 1. While Luther remembered gathering flowers of *Arethusa* every spring, this species has unfortunately not been documented in Kent County since 1896 (MICHIGAN FLORA ONLINE 2011).

TABLE 1. Luther Livingston's notes and Cole's incorporation of the information from them into the *Grand Rapids Flora*.

Luther Livingston's Notes (Gray Herbarium Archives)	Emma Cole's <i>Grand Rapids Flora</i> (Cole 1901, page 47)
	<b>ARETHUSA L.</b>
402 [400]. A[rethusa] bulbosa [Arethusa] The first I saw were gathered by my brother Lincoln in the spring of 1882 or 1883. We gathered them every spring as long as I was in G. R. They grew in the soft mounds or cushions of living sphagnum, never were very abundant but, I presume we have gathered 30 flowers in a season.	<b>400. A. bulbosa L.</b> In the sphagnum of Orchid Swamp; rare. Mid May–Mid-June. L. S. Livingston and Prof. R. H. Wolcott report this species as having been rather abundant in this swamp in the eighties. In 1898 seven plants were found (O.H.)
I think "In sphagnum in Orchid S." would be better than in bogs because they did not grow in really boggy places as did the Calopogon, for instance. [Emma took his advice.]	[O.H. = Our Herbarium, collections of Homer Skeels & Jennie Shaddick; Orchid Swamp now extinct].

In fact, the incredibly interesting "Orchid Swamp" has been lost to growth and development of Grand Rapids. Also referred to as Burton Avenue Swamp (Figure 2, Wyoming Twp. Sec. 2), this site once occupied a large area southwest of the 1900 City boundary and was famous for a number of rare, acid-loving plants, especially orchids.

Having sent Luther Livingston a copy of her newly printed *Flora*, Emma Cole informed him of the costs of producing this work—which came out of her own pocket (Table 2), (Cole letter, Apr. 10, 190[1], Appendix 2, Letter 16).

TABLE 2. Statistics relating to the production of the *Flora*, including the costs to Emma Cole of carrying out the *Flora* project (Emma Cole unpublished letter to Luther Livingston, April 10, 190[1], Gray Herbarium Archives, Harvard University). The 2018 values in parentheses are from Official Data Foundation (2018).

Item	Expense or other data
Printing and map insert	\$226.00 (\$6,749.26)
Expenses for summer fieldwork	\$324.00 (\$9,675.94)
Price per book	\$1.00 (\$29.86)
Number of copies printed	1000
Market	Public libraries, private libraries, Cole's pupils, reference in the surrounding counties
Estimated supply	Approx. 50 years

## LIFE AFTER THE *FLORA*

The Spring of 1901 brought the publication of *Grand Rapids Flora: A Catalogue of the Flowering Plants and Ferns Growing Without Cultivation in the*

*Vicinity of Grand Rapids Michigan* (Cole 1901). With such an all-consuming project having come to an end, Emma now had time to give greater attention to a difficult group of plants that had fascinated and perplexed her during her *Flora* project, the genus *Crataegus* (Rosaceae). That same year she received her first visit from Charles Sprague Sargent, Director of the Arnold Arboretum at Harvard University. Sargent was the outstanding authority of his time on North American trees, and he produced numerous publications on woody plants, including *The Silva of North America* (14 volumes, Sargent 1890–1902) and *The Manual of the Trees of North America* (Sargent 1905), both still standard references.

Among Sargent's many passions was the genus *Crataegus*, or what we know as the hawthorn or thornapple. Voss (1985) wrote in *Michigan Flora*, "*Crataegus* is a genus easy to recognize, but the species (or other taxa) of which drive most botanists to distraction. Hybridization, polyploidy, and apomixis presumably account for much of this complexity, asexual populations breeding true and acting as species but better thought of as individuals." Voss further noted that, prior to 1900, regional floras included only a handful of species, but between 1900 and 1925, more than 1000 supposedly distinct new species of *Crataegus* were described (most based on trivial characters), more than 700 of these by C. S. Sargent. Among these were species included in his treatment of *Crataegus* in southern Michigan (Sargent 1907).

The details of the taxonomic debate surrounding this genus as to which of these species are truly distinct has created a nomenclatural labyrinth. Suffice it to say that, according to Voss (1985), Michigan "was one of the active sites in the early 'expansionist' days of hawthorn study." Emma Cole sent a large amount of material to Sargent. As a result of Sargent's visit to Grand Rapids in September 1901, as well as of her research in collecting both flowering and fruiting specimens from the same trees, Sargent (1902b) credited her help in describing twenty new species, and even named one *Crataegus coleae*, a recognition that has persisted despite disputes between "lumpers" and "splitters." Fernald (1950) stated in *Gray's Manual of Botany* that *Crataegus coleae* was "named in 1902 for its discoverer, Emma J. Cole," and Voss and Reznicek (2012) retained its status as a distinct species in *Field Manual of Michigan Flora*.

Emma Cole (1902) wrote a newspaper article about another hawthorn for *The Evening Press* on June 21, 1902, chronicling Sargent's visit to the city the previous autumn and his discovery of another species, *Crataegus gemmosa*, based on a tree located on the north side of the city. In her article "Grand Rapids Owns a Famous Thorn Tree," she wrote: "The [specimen] for the drawing was taken from this tree; this makes it a type plant" (to which the scientific name is nomenclaturally attached) in Sargent's (1890–1902) *Silva of North America*. The species was described by Sargent (1902b) based on specimens known from Ontario (near Toronto and near London), New York (Rochester), and Michigan (Belle Isle and Grand Rapids); the collection from Grand Rapids (*Miss E. J. Cole and C. S. Sargent*, s.n. (A), September 1901) was among those cited as a type specimen.

Emma Cole and Charles Sargent corresponded for the rest of her life. Emma spent the summer of 1904 working with Sargent at the Arnold Arboretum in Jamaica Plain, Massachusetts (Anonymous 1906; Barkley 1911). During that time,

she collected about 75 specimens in Jamaica Plain and in Cambridge between June 25 and August 20 (University of Michigan Museums 2016). Sargent returned to Michigan for another visit in 1907, as referenced in the typewritten copies of some of the 15 letters he sent to her that are preserved in the Harvard University Arnold Arboretum Horticultural Library archive (Correspondence of C. S. Sargent) (reproduced here in Appendix 3). Unfortunately her letters to him are not in that archive.

Once she was freed from the demands of documenting the flora of the Grand Rapids area, Emma indulged in some traveling. The most valuable record of her travels is her herbarium. Wherever she went she collected, preserved, and labeled plant specimens that provide a chart of her progress through the years and across the continents. It is from her herbarium specimens that we know that she was in Europe from early July to mid-October 1903. This was no “package tour!” In fact, we can trace her travels as she collected plants in Wales, England (near border with Wales), Ireland (in the area now constituting Northern Ireland), Scotland, England (London area), France (Paris area), The Netherlands, Germany, Switzerland, Italy, and the French Mediterranean coast. In a letter to B. L. Robinson in 1904 asking about published floras for areas in Europe, she mentions her desire “...to identify my collection as far as possible myself. I have about four-hundred specimens in all. One hundred sixty from the British Isles which I have just been going through” (Cole letter, Jan. 21, 1904, Appendix 1, Letter 27). A total of 221 specimens from these travels are known to be extant at the University of Michigan Herbarium (University of Michigan Museums 2016) (Table 3); the whereabouts of the others is unknown.

Before she left for Europe, Emma made out a Last Will and Testament (Cole 1910) in which she established several significant bequests. Among these bequests was a modest trust for the Board of Education of Grand Rapids for the support of the Botany Laboratory at Central High. To the Kent Scientific Institute she willed her personal herbarium, along with her microscope, prepared

TABLE 3. Numbers of specimens collected by Emma Cole during her travel to Europe in 1903, based on data in the University of Michigan Herbarium Specimen Database (University of Michigan Museums (2016).

Date of Collections	Geographical Location	Number of Specimens
July 3	Wales	32
July 4	England (near border with Wales)	3
July 8	Ireland (Dublin)	1
July 9	Ireland (Belfast area)	20
July 13–21	Scotland (Stirling/Abbotsford etc.)	35
July 24–Aug 6	England	8
Aug 14–18	France (Ile-de-France)	17
Aug 23	The Netherlands	3
Aug 30	Germany (Thuringia area)	24
Sept 8–9	Switzerland (Lake Lucerne area/Bern/Geneva)	51
Sept 27–Oct 6	Italy (Rome/Naples)	20
Oct 10	France (French Alps/Nice)	7
<b>TOTAL</b>		<b>221</b>

slides and lantern slides, 300 copies of *Grand Rapids Flora*, and future revenue from the sales of the *Flora*. According to the KSI Annual Report of 1912, the collection numbered 3,581 completed pages, plus 1,278 pressed specimens waiting to be mounted (Grand Rapids Public Museum 1912).

There is evidence that she spent July and August of 1905 in the American West, where she visited her former student, Earle Mulliken, and did botanical work at the University of California at Berkeley (Anonymous 1906). This trip is also substantiated by specimens collected in southern California (11 specimens), Alberta (Banff National Park, 15 specimens), British Columbia (Glacier National Park, 23 specimens), Seattle, Washington, (5 specimens), as well as a stop at the little town of Bottineau, North Dakota, to visit her brother John (65 specimens) (University of Michigan Museums 2016).

Sometime after her western US trip in 1905, Emma began to have health problems. In 1906, Sargent made reference to her health (Sargent letter, 23 Aug. 1906, Appendix 3, Letter 2), and his January 30, 1907 letter (Appendix 3, Letter 5) was addressed to her at The Park [Hotel] in St. Louis, Michigan, a well-known hotel spa famed for its magnetic mineral springs and often called the "Saratoga of the West" (see also Sargent letter, Aug. 31, 1907, Appendix 3 Letter 11, referring to his letter of Aug. 16<sup>th</sup>, letter 10, that also had been addressed to the spa in St. Louis, Michigan, but had apparently not been received by Cole). Prompted by continuing health issues, she added a codicil to her will in November 1907, that among other things, provided a trust for the care of her brother Hugh. Apparently there had been some bad feeling between the two, which was expressed quite vehemently in her original will.

Emma retired from teaching at Central High School in May 1907. That September Professor Sargent returned for another visit and more hawthorn botanizing, and he wrote to her after he returned to Harvard that he was delighted that she "got no cold in those two stormy days" (Sargent letter, October 29, 1907, Appendix 3, Letter 14). When their work on Michigan hawthorns was largely finished, she sent him all her duplicate specimens of *Crataegus* in June 1908, along with all her notes on them (see Appendix 3, Letter 15, acknowledging receipt, and Letter 16, dated June 16, 1908, with Sargent's detailed comments on the specimens and notes). At least 20 species of hawthorns described by Sargent as new to science were based on Michigan collections of Emma Cole (see Appendix 3, Letter 6).

In October 1907, Emma wrote to Mary Ann Day, librarian of the Harvard University Gray Herbarium Library at Cambridge. She told Miss Day of her upcoming trip to Cuba and asked if she knew of an English translation of a guide to the flora of the West Indies. If there was only a Spanish-language edition available, she continued, would it be better to buy it beforehand or wait and buy it in Havana (Cole letter to Miss Day dated Dec. 24, 1899, Gray Herbarium Archives)? She did manage to botanize on that trip, but her collections are few (35 specimens, MICH), with labels dated between mid-February and mid-April 1908. Emma was in Michigan for the summer of 1908, according to continuing correspondence with C. S. Sargent, but she escaped during the winter of 1909 to California, according to her friend Orinda Barkley (1911).

In January 1910, Emma went to Mexico on a plant collecting trip. She fell ill

in April on her return journey. When she reached San Antonio, Texas, she was hospitalized and died shortly thereafter (Barkley 1911). According again to Miss Barkley her illness was pronounced “walking typhoid,” but her death certificate, dated April 25, 1910, says that the cause of death was acute nephritis, that is, kidney failure.

Emma Cole’s death was widely reported in the Grand Rapids (Anonymous 1910a, c) and Lowell newspapers (Anonymous 1910b, d). That she was an active and well-known personality was apparent not only from the obituaries, but also by public tributes such as high school teacher W. A. Greeson’s (1910) memorial of Miss Cole, and Orinda Barkley’s (1910) tribute before the Ladies Literary Club, where Emma was a long-time member and frequent presenter, and by her fellow Michigan educators.

Emma left behind a very substantial estate (Cole 1910), totaling \$27,562.27 (\$734,928.24 in 2018 dollars, based on the inflation calculator at Official Data Foundation 2018). She left cash bequests to two dozen personal friends, to her brothers, a niece and nephews. She also left an unusual endowment of \$5,000 to nine downtown area churches to fund an annual “flower service” to be held on the second Sunday of June, the sermon to be focused on flowers and the churches to be amply decorated with floral arrangements, with the object of perpetuating the love of and interest in flowers. Eight of those nine churches carried out this request, holding services each year, an activity that continued through 1967, as documented in large ledgers at the Grand Rapids Public Library. An appreciation of Emma Cole was published regularly in the bulletins accompanying the flower services, written by Charles W. Garfield (1934), who was in 1865 a founding member of the Grand Rapids Scientific Club, one of the two original organizations that became the basis for the Kent Scientific Institute (Stivers 2004). In his tribute, Garfield (1934) wrote, “Miss Cole saw the ruthless destruction of the beauty given us in the wealth of Nature’s productions” and “[she] felt that there was a spiritual significance connected with the responsibility of mankind to maintain the delicately beautiful things . . . .”

Perhaps the most interesting gift in Cole’s will was an endowment to the Regents of the University of Michigan establishing the Emma J. Cole Fellowship, which persists to this day, a fellowship in Botany for a graduate student who “has given evidence of distinguished attainments.” Dr. Edward G. Voss was a recipient during his doctoral program, and Dr. David P. Warners, our colleague on the present Emma Cole flora project, received the Cole Fellowship during his doctoral program. The payout to the University of Michigan was an impressive \$14,611.36 (\$389,601.48 in 2018 dollars).

After Emma’s death, F. C. Newcombe, professor of Botany (Barkley 1911) at the University of Michigan, wrote to her friend Orinda Barkley requesting biographical material to use in conjunction with the Cole Fellowship. She sent him a tribute she had presented before the Ladies Literary Club on May 20, 1910. In a note, she added some more personal information. She wrote that Emma was buried in the Vergennes Township cemetery near the church she had attended when a girl and that “[f]rom her grave can be seen her early home, the school house in which she first taught, —the woods where she first gathered the flowers she studied.” It’s very easy to find her grave, adjacent to the little Methodist

church at the corner of Bailey Drive NE and Parnell Avenue NE between the town of Ada and city of Lowell, marked by a large stone which Emma herself had selected years before.

Over 100 years ago, Emma Cole dedicated herself to researching the natural biodiversity of West Michigan and creating a record of it. Even then she expressed great concern about what was being lost. In the Introduction to the *Flora*, Cole wrote:

Since the district has become more thickly settled, it is undergoing rapid transformation. Much of the swamp land is being drained, cleared, and utilized; forests are being deprived of their valuable timber, and uplands converted into farms. The woodlands at present consist mostly of the 'wood-lot' reserved by the farmer.

With understated and perhaps unintended irony, she concluded, "From the standpoint of systematic botany, this district is unfortunate in having *so little* territory which is not capable of cultivation" [italics added].

At the end of Emma Cole's newspaper article about the hawthorn tree she and Charles Sargent found in Grand Rapids (Cole 1902), she wrote, "It is with this beautiful tree as with many noble people—honor comes tardily yet deservedly to crown the best part of life—that enriched by experience." Emma's life was richly crowned by experience, unusually so for a woman of her time. By her passion and her pursuit of a professional vocation in science during a time when it was very difficult for women to do so, she inspired, and continues to inspire, botanists both amateur and professional, who love the natural world and wish to preserve it. In 1994, she was remembered in the celebration of Women's History Month in Grand Rapids in a play about several of the city's significant women (Bahle 1994), and in 2000, Emma's work was highlighted in an exhibition at the Frederik Meijer Gardens & Sculpture Park in Grand Rapids, also as part of Women's History Month. Her induction into the Michigan Women's Hall of Fame in 2007 continued the recognition of her life's work and her contributions to both science and education. And her *Grand Rapids Flora* continues to provide a critical historical context and inspiration for us to know Grand Rapids' flora in the twenty-first century.

#### ACKNOWLEDGMENTS

We wish to express our appreciation to the Grand Rapids Public Museum for access to information on the Kent Scientific Institute in the Community Archives and Research Center, and to the Grand Rapids Public Library for access to the Emma Cole files in the Grand Rapids History & Special Collections, Archives. The Harvard University Herbaria - Botanical Libraries (Gray Herbarium archives) kindly provided access to letters handwritten by Emma J. Cole to botanists Benjamin Lincoln Robinson and Merritt Lyndon Fernald, as well as letters to her proofreader Luther Samuel Livingston. The Arnold Arboretum of Harvard University Horticultural Library Reference Services provided photocopies of letters from Charles Sprague Sargent to Emma Cole. The University of Michigan Herbarium Archives provided the letters from Charles Faye Wheeler to Emma Cole. We are grateful to the University of Michigan Herbarium for access to Emma Cole's specimens as well as specimen data of colleagues and students relating to the *Flora* project from the late-1800s; the late Dr. Edward G. Voss, Dr. A. A. (Tony) Reznicek and Beverly Walters were especially helpful at various stages of our project. The Michigan State University Herbarium likewise provided access to specimens and specimen data documenting Cole's work. We would like to express our appreciation

to Megan Crow and anonymous reviewers for reading and suggesting changes to improve the manuscript.

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## APPENDICES

These appendices reproduce the text of the letters chosen for inclusion. All header and other ancillary information other than the city and the date is omitted. No attempt has been made to reproduce the format of the date or the placement on the page of such items as the header, the signature, or other similar items. Editorial comments by the authors inserted in the bodies of the letters are enclosed in square brackets.

APPENDIX 1. Letters from Emma Cole to Dr. Benjamin Lincoln Robinson (1864–1935) and Merritt Lyndon Fernald (1873–1950), Gray Herbarium of Harvard University. Handwritten letters in Gray Herbarium Archives, Harvard University Herbaria Botanical Libraries (photocopies obtained by Julie Stivers on March 13, 2007 and transcribed by Garrett Crow and Julie Stivers).



FIGURE 3. Dr. Benjamin Lincoln Robinson, Director, Gray Herbarium, Harvard University (Photo ca. 1900; source: Botany Libraries photograph collection, Harvard University).



FIGURE 4. Merritt Lyndon Fernald, Assistant, Gray Herbarium, Harvard University (Photo 1904; source: James Franklin Collins papers, Botany Libraries photograph collection, Harvard University).

#### LETTER 1

Grand Rapids, October 20, 1898  
Dr. Robinson,

Do you intend to revise Gray's Manual and follow the new arrangement of orders [families] and the nomenclature of the "Synoptical Flora" [Gray 1888]? We use the Lessons & Manual in our High Schools. I am ready to make out a list of plants of this locality and the question of nomenclature and arrangement of families trouble me. What would you advise me to do? If you can give me any assistance in this matter of discussion I shall be greatly obliged to you.

Yours Respectfully,  
Emma J. Cole

#### LETTER 2

Grand Rapids, October 30, 1898  
Dr. Robinson  
Dear Sir.

Yours of the 25<sup>th</sup> is at hand and I have been thinking seriously over its contents and have made up my mind to follow your advice. [I]t is better to be sure of the plants than to be too particular about nomenclature and they have all been named with Gray. Prof. C. F.

Wheeler has from time to time gone through the herbariums of the City and has identified the sedges and all other doubtful plants and the "List" when published ought to represent this district thoroughly and accurately. I think I shall get my "List" ready for publication this winter, writing each species on a separate card, and when the "School Manual" has been revised, go through and make the changes which are not yet published in the Synoptical Flora [Gray 1888]. Then my "List" will be in agreement with the "School Manual" and also with the "Synoptical Flora", as I now understand it. If the "Manual" is published within the coming year, this will not delay me very much and I shall have another season. I am trying to cover twelve miles in any direction from a central point in the City; and we have now nearly twelve hundred plants. It is a very rich district as the Northern and Southern State floras overlap in the Grand River Valley. If you will be kind enough to let me know if my plans can be carried out regarding the "Manual" I shall begin my manuscript at once.

Yours truly,  
Emma J. Cole

### LETTER 3

Grand Rapids, [no date, but seems to fit after the October 30, 1898 letter to Robinson]  
Dr. B. L. Robinson.  
Dear Sir.

In thinking over my manuscript, I have decided to send you my list of plants which will be placed in the Introduction of my Flora. I shall have them put in, in double columns alphabetically without authority or common name, just as I have noticed lists in the Government publications. If these are correct, it will make it much easier for my publisher because a change in nomenclature changes its place in the "list." So I have thought best to send the manuscript lists instead of waiting for the proof as I at first thought. The proof of the main part of the book can be changed with little trouble. The manuscript as I send it, is a rough copy of that which I retain, so scratch it up or correct it as it needs. You need give no attention to the spelling, just see if I have revised as I should have done. Prof. C. F. Wheeler has assisted me on the sedges, still you may see changes that he has omitted, there are few sedges in the lists I send you. The northern v Southern Plants overlap in the Grand River Valley and I have tried to show this by my lists. I have also tried to give a picture of the lesser flora in our "oak openings." I am not certain how I should service *Physalis lanceolata* Michx. Whenever the authority of the species differs from Gray's Manual 6<sup>th</sup> Edition I have added it for you. I hope I am not troubling you too much. but I feel that you are doing me a great favor in looking after the nomenclature. Prof. C. F. Wheeler has been very kind, but he is in delicate health every winter and scarcely car...[carries?] his own duties. So my manuscript has had no thorough looking through.

Yours Sincerely,  
Emma J. Cole

### LETTER 4

Grand Rapids, December 2, 1899  
Dr. Robinson  
Dear Sir

I wrote to you last year about the nomenclature in my "local list of plants." I have made it out according to the Kew Index [Index Kewensis, Jackson 1893], putting in parenthesis the names in the 6<sup>th</sup> Edition of Gray, when they differed materially. Some of the

plants given as varieties I have made species, as some of the genus *Crataegus*. Is there any way that I could obtain the changes you are making in the edition now in progress? My list I expect to have published this winter.

Yours sincerely,  
Emma J. Cole

#### LETTER 5

Grand Rapids, December 10, 1899  
Dr. B. L. Robinson  
Dear Sir.

Your kind offer to examine my manuscript or proof is very gracious. I have the manuscript written in cards, one card to a plant. It would be much easier for you to run through one of the first proofs and see if I have omitted what I should have added. I hope this will not inconvenience you with your many duties. I shall not get it in the hands of the publisher till after holidays.

Yours sincerely,  
Emma J. Cole

#### LETTER 6

Grand Rapids, February 23, 1900  
Dr. B. L. Robinson.  
Dear Sir.

Inclosed [sic] you will find proof for the first pages of the "Grand Rapids Flora". The nomenclature in the main is the Kew Index [Index Kewensis, Jackson 1893]. The names in parenthesis are those of the Gray [Gray et al. 1890], the italics are the Britton [Britton and Brown 1896–1898], when these changes are simply a gender ending I have not added them. I hope you will feel free to make such suggestions or corrections you think should be made. I am having the Catalogue part printed first, as the preface will be a easy matter for the printer.

Be so kind as to return the proof at your earliest convenience.

Sincerely yours.  
Emma J. Cole

#### LETTER 7

Grand Rapids,  
March 7, 1900  
Dr. B. L. Robinson –  
Dear Sir:

I do not wish to occupy too much of your time but there are a few points upon which I am not clear.

1<sup>st</sup>. In printing *Aleopecurus geniculatus aristulatus* Torr. would you advise that I print it *A. geniculatus aristulatus* in small capitals or only the *aristulatus*?

The same question arises regarding *Phalaris arundinacea picta*, which grows in all of our marshes and I have included it as an introduced plant. I have intended to put introduced plants in small capitals as in Gray.

2<sup>d</sup>. Shall I write *Cyperus aristatus* Rottb. or *C. inflexus* Muhl.? How do you intend to have it in the revision of the Flora?

I thank you for your advice and assistance and regret that as my manuscript is in the hands of the printer, I shall not be able to make many changes. Then too I am very busy with school work for I have 110 pupils in my classes in Botany to meet daily. My printer is busy for a few days with this work and I think I may be able to hear from you before my galle [sic] sheets go into book form.

Sincerely yours,  
Emma J. Cole

#### LETTER 8

Grand Rapids,  
April 10, 1900  
Dr. B. L. Robinson.

I send you more proof sheets. I hope you will criticize the authority of my grasses and sedges if it does not meet your approval, as well as the nomenclature.

I see the Kew [Index] has *Habenaria herbeola* R. Br. for *Habenaria viriscens* Spreng, would you advise placing the Kew name first and the Gray name second, or omit the Kew? Also *Betula papyracea* Ait. for *B. papyrifera* Marsh.? Please advise me.

Do you intend to leave the authority of the genus the same as in Gray 6<sup>th</sup> edition, or revise according to the Kew? I find Gray does not always coincide with the Kew and Britton [and Brown] uses *L.* instead of *Tourn.*

Yours sincerely,  
Emma J. Cole

[Note: Cole used *Habenaria viriscens* Spreng, with *H. flava* (L.) Gray as a synonym; the accepted name today is *Platanthera flava* (L.) Lindl.]

#### LETTER 9

Grand Rapids, May 12, 1900  
Dr. B. L. Robinson  
Dear Sir:

Inclosed [sic] please find a few sheets of proof. There are a few questions upon which I wish you would advise me. Shall I use *Eleocharis pauciflora* or *pauciflorus*? *Rhynchospora laeviseta* or *laeviseta*?

In writing you last winter regarding *Cyperus aristatus* Rottb. whether it should be revised to *C. inflexus* Muhl. you said let it remain *aristata* for the present. You had not decided just what revision you should make. I must know soon for it comes in this proof and must have its place in alphabetical order.

Shall I use *Brunella* or *Prunella*?

Shall I use *Physocarpus opulifolius* Maxim? or *Neillia opulifolia* Benth. & Hook.?

Please return as soon as possible.

Yours sincerely,  
Emma J. Cole

[Note: Oddly, *Eleocharis pauciflora* did not appear in the *Flora*, although she had two specimens so identified (was this an accident?); Voss (1972) applied the name *E. pauciflora* to this entity, but it was treated as *E. quinquefolia* in Voss and Reznicek (2012).

The name *Rhynchospora laeviseta* (or *laeviseta*) does not appear in the *Flora*, nor does it appear as a published name in Tropicos (2018).

Cole used *Cyperus aristatus* in the *Flora*, now considered to be a synonym of *C. squarrosus*); she indicated *C. inflexus* as the name used by Britton and Brown (1896–1898).

*Prunella* appeared in the *Flora*.

Cole used the name *Neillia opulifolia* in the *Flora*, whereas *Physocarpus opulifolius* is the accepted name today.]

#### LETTER 10

Grand Rapids, May 24, 1900

Dr. B. L. Robinson

Dear Sir:

Inclosed [sic] find another set of proof sheets. I have as yet not received the last set I sent you, so I published without your corrections. They were mailey [mailed] May 19<sup>th</sup>. I hope I am not taxing your time and patience too much. Please return proof promptly if possible. I fear my last did not reach you.

Yours,

Emma J. Cole

#### LETTER 11

Grand Rapids, June 15, 1900

Dear Dr. Robinson.

Here is more proof. I shall be very glad to send Mr. Fernald my proof during vacation, it is very kind of him to take this extra work when he should be recreating[.] The next set I will mail to him. I wish you a pleasant voyage and a delightful trip and I am sure you will have both. Please return proof as soon as possible.

Yours sincerely,

Emma J. Cole

#### LETTER 12

Grand Rapids, June 23, 1900

M. L. Fernald.

Dear Sir,

I have a collection of *Antennaria plantaginifolia* Hook. which I should be glad to have you look over if you will kindly do so. I will number them and you may return the numbers of my duplicates.

I also take the liberty of sending you a mustard and a green little plant which I cannot make much out of. I collected them in a meadow near the Fair Ground. I sent the mustard to the Mich. Agricultural College but they were not able to identify it as to its species. Thought the genus was *Sisymbrium*. I hope I am not taxing your patience too much.

Yours,

E. J. Cole

[NOTE: The *Sisymbrium* referred to here is undoubtedly the species called *S. irio* in the *Flora*. Crow (2017) discussed this entry as follows:

*Sisymbrium loeselii* L. (*Sisymbrium irio* of Cole; Small Tumbleweed Mustard; June 1900 (GH); 13 June 1900, MICH); June 1900 (MSC). Cole suggested that this adventive native to eastern Europe and west and central Asia may have been introduced into Paris Twp., Sec. 19 by use of refuse from the Felt-Boot Factory as fertilizer (see *Verbesina encelioides*), as the factory imported considerable material from India, Persia and Russia). Oddly, however, her letter indicates that the specimen was collected near the Fair Ground, but the label for the 13 Jun 1900 (MICH) clearly indicates Paris Twp., Sec. 19.

See also next letter (June 30, 1900).]



## LETTER 13

Grand Rapids, June 30, 1900  
 M. L. Fernald  
 Dear Sir

I send my proof hoping you may glance at its nomenclature and see if I have revised correctly. I am sorry to take your time on the eve of so delightful a trip as you are about to enjoy. You need not trouble about anything else. I will make an extra effort to see the errors, if you can find time for nomenclature and its authority. I shall be greatly obliged. Is *Sisymbrium Irio* introduced from Europe? If so it should be in small capitals. Is it introduced to any extent in the U. S.? Any little information I shall be glad to include in my note to the species. The Britton nomenclature I print in italics—the Gray when it differs from the Kew [Index] (which is the nomenclature I publish in). I print in brevier [8-point type] with authority in italics.

Yours respectfully,  
 Emma J. Cole

P. S. The *Antenarias* I will send after your return. There is no haste.  
 E. J. C.

## LETTER 14

Grand Rapids, July 17, 1900  
 Mr. Fernald.

I presume my proof will reach you now, so send it. I feel that I must keep as close to the Kew Index as I consistently can, but shall be glad always to make changes in nomenclature whenever plants have been misnamed or when there is a change in American nomenclature by American botanists. I appreciate highly the work you are doing for me. Please return proof at your earliest convenience and oblige.

Yours sincerely,  
 E. J. Cole

P. S. By an error the manuscript of Leguminosae [Papilionaceae in the *Flora*] has been commenced before Rosaceae has been completed, but I send it along for correction.

[Note: Emma's reference to American nomenclature relates to Nathaniel Lord Britton's application of the American Rochester Code regarding nomenclature, which differed from the European Code which Kew Index followed. Hence, she followed the Kew Index carefully (as did Robinson and Fernald as they were preparing the 7<sup>th</sup> edition of Gray's Manual), but presented as synonyms the scientific names in Britton and Brown (1896–1898). See Crow (2017) for discussion of Cole's dilemma regarding nomenclature during the production of the *Flora*.

The legumes have sometimes been treated as three distinct, but closely related, families; Cole uses the family names Papilionaceae and Caesalpiniaceae in her *Flora* for the legumes instead of a single family Leguminosae (or Fabaceae as the family name in use today, having the -aceae ending. The third segregate legume family, Mimosaceae, has no genera in Michigan.]

## LETTER 15

Grand Rapids, August 18, [1900]  
 Mr. M. L. Fernald.  
 Dear Sir.

I mail you my specimens of *Antennaria* and some sedges which I have labeled in my lists, for you to see. I presume one at least will have to be corrected. *Euphorbia Presslii* I

presume is *E. nutans* as you suggested. Would you say in the Catalogue that *E. nutans* [take] the place of *E. Preslii* which is not known to occur in the U. S. or leave it as in the proof?

Yours respectfully,

E. J. Cole

[P.S.] I wish you would advise me as to the following changes.

*Euonymus obovatus* instead of *E. Americanus obovatus*?

*Acer nigrum* instead of *A. saccharum nigrum*.

Wahoo or waahoo [*Euphorbia*]

*E. nutans* Lag. (*E. Preslii* Guss.)

Sumach or sumac

Please return at your earliest convenience as I expect to go into the country for a few days after the proof is in. The plants I send you[,] you can look at when you have leasure [sic].

In Haste –

E. J. C.

[NOTE: With respect to the alternatives in the postscript, Cole's *Flora* has the following entries:

*E. Preslii* Guss. (with *E. nutans* Lag. in italics as a synonym); this name is now regarded as a synonym under *Euphorbia nutans*).

*Acer saccharum nigrum*

Wahoo

Sumac]

#### LETTER 16

Grand Rapids, October 26, 1900

Dear Mr. Fernald.

Inclosed find a plant of our *Potentilla canadensis* L. I think during the Summer you corrected it in my proof to *P. ~~striata~~ simplex* Michx. I send you a plant to see if this is the plant you had in mind, flowers small and yellow. The page is to be reprinted and I thought now was the time to change if there is to be one.

Is *Stachys asper* var *glabra* Gray the same as Britton's *S. tenuifolia*? In no 989 shall I use small capitals?

Please look to *Physalis Virginiana*. I think there is an error in Gray. Should it not have been *Pennsylvanica*? I think the catalogue will be completed with two proofs more.

Yours sincerely,

Emma J. Cole

P.S. Do you consider *Brunella vulgaris* an introduced plant?

E. J. C.

[Note: *Stachys asper glabra* is the name used in Cole's *Flora*, with *S. tenuifolia* as a synonym; however, the name in current use is *Stachys tenuifolia* (Crow 2017).

*Brunella* vs. *Prunella* was a question earlier in Letter 9. *Prunella* was ultimately the spelling used in the *Flora*.]

**LETTER 17**

Grand Rapids, November 13, 1900

Mr. Fernald

Dear Sir:

I hope you will feel free to add or change notes to *Antennaria*. I know nothing about them. I simply have collected what I considered to be different. I think Prof. Wheeler of Lansing sent my collection of last season to you. So you have seen the entire collection.

Sincerely yours,  
Emma J. Cole

**LETTER 18**

Grand Rapids, November 17, 1900

Mr. M. L. Fernald.

Dear friend:

In writing to Prof. C. F. Wheeler about the two plants in the genus *Scirpus*, *S. cyperinus* Eriophorum (Michx.) Britton (*Eriophorum cyperinum laxum* Wats. & Coult.) and *S. microcarpus* Presl. (*S. sylvaticus digynus* Boeckl.) which I sent you during the summer. He thinks we may have both species and varieties. He has been thinking over them lately. If you have these plants still and will be kind enough to mail them to him I should like him to see what I sent you. I studied a specimen of what he called *Eriophorum cyperinus laxum* last winter and could make nothing but *S. cyperinus* out of it, but when he looked over other species of mine he called it that variety. I do not know enough about sedges to be sure of my identification. Yet I generally know when I see different ones and have made my collection and he has identified it. I may not have been so very observing about these plants. If you have not saved these plants it makes no particular difference but if you have them I would like to have them mailed to Prof. C. F. Wheeler Lansing, Agricultural College, Lansing, Mich.

I hope I am not giving you too much trouble. When I get this List published I hope you will check the plants you must desire and let me collect some for the Herbarium. I should be pleased to do it. Proof received today.

Yours Sincerely,  
Emma J. Cole

[Note: There seems to be a question as to whether or not there are two varieties of *Scirpus cyperinus*; Cole could not distinguish two distinct varieties, but Professor Wheeler thought both might be in her district. Interestingly, she ended up recognizing only one variety (*S. cyperinus* var. *erriophorum*, but not var. *cyperinus*) in her *Flora*. Today *S. cyperinus*, without varieties, is recognized for Michigan (Voss and Reznicek 2012). The other *Scirpus* mentioned in the letter, *S. microcarpus*, is now treated as a synonym of *S. expansus* (Voss and Reznicek 2012).]

**LETTER 19**

Grand Rapids, November 24, 1900

Mr. M. L. Fernald

Dear friend.

I like the liberty to mail to you these members of *Senecio* if you will kindly look them over and give me your opinion. I presume they are correctly identified, but the group is troublesome. The one labeled *S. aureus* in pencil I found in a wet meadow and these were

summer plants but all small like this. Would you in the "index" to my flora give all the common names (e.g./ *Quercus*. Oak). Are both necessary but would black oak, white oak etc. be of enough value in so small a list as mine be of any especial value? If you will allow me to further intrude upon your time and patience I should like you to see my preface and index. You always see some error which I do not.

Yours,  
Emma J. Cole

#### LETTER 20

Grand Rapids, January 7, 1901.  
Mr. M. L. Fernald.  
Dear friend.

Inclosed [sic] please find my Introduction. There are still about four pages at the end. Please criticise [sic] general style, plant lists as to orthography &c. You see this publication spans two centuries it ought to be a good omen.

Yours,  
Emma J. Cole

#### LETTER 21

Grand Rapids, January 26, 1901  
Dear Mr. Fernald.

I made the changes which you suggested regarding yourself and Dr. Robinson in my Introduction. You were quite right about it. I also united some of the smaller paragraphs. This is the end of my Introduction, I hope you are not getting tired of it, but all trials end and sometime even this.

Yours sincerely,  
Emma J. Cole  
P. S. Should Statistics of the Catalogue be in such large type? Is it in the best place?

#### LETTER 22

Grand Rapids, April 14, 1901  
Dr. Robinson.  
Dear Sir.

I wish to express my sincere gratitude to both yourself and Mr. Fernald for the kindly assistance you have given me on my Flora. If there are any plants mentioned in my Catalogue which you especially desire, kindly let me know and I will try to send them to you. Would it be asking too much of you to give my publication a mention in some one of the Eastern Botanical Journals? [See Robinson 1901.] The sale will be limited and I wish as general a notice as possible. I hope both yourself and Mr. Fernald have received the copies I mailed you a few days ago. You doubtless can see some merits and many demerits as no publication can be perfect or even satisfactory entirely to the writer, yet I trust it may help some who wish to consult it. Kindly thank Mr. Fernald for me for his kindly patience and assistance to the end. Again thanking you I remain

Yours truly,  
Emma J. Cole

**LETTER 23**

Grand Rapids, June 9, 1901

Dear Mr. Fernald:

I hope you do not consider me ungrateful for the assistance you gave me on my Flora, because I have not written to you directly before. I wish to thank you personally now, for I do not know what I should have done without your kindly and ever cordially given assistance. I have been so very busy since the completion of my publication that I have found little time for anything but the work of the day, and the days have been a series of successively busy ones. I hoped to begin a collection of our Eriophorum and Scirpus for you about here but I have not been able to do so as yet. Are there any of our plants you would like particularly? If so I will try and send them to you. I should like very much your publication of Antennaria. I think you told me you were preparing a paper on that genus. I received your paper on the subject of Botanical nomenclature and was very much interested in it. It was a strong argument well substantiated. I wish to thank you for it. I hope you will have an enjoyable summer. I expect to be in western Pennsylvania for a few weeks after our school closes.

With best wishes for your success.

I remain Yours Sincerely,

Emma J. Cole

**LETTER 24**

Grand Rapids, December 2, 1901

Dear Dr. Robinson.

I wish to express to you my thanks for a copy of your Denver Address. I have read and reread it with great pleasure and profit. It makes me feel that I can scarcely wait till spring opens to work along some of the lines you have suggested. Thanking you again that you were so kind as to see that I have the copy. I remain

Yours Sincerely

Emma J. Cole

**LETTER 25**

Grand Rapids, November 12, 1902

Dear Dr. Robinson.

Your publication "Flora of the Galapagos Islands" is at hand. I am very much interested in it. I congratulate you upon your success. Please say to Mr. Fernald that I have read with pleasure his publication on the Birches. Sometime when I am in northern Michigan I might send you some [plants]. Thanking you cordially for your kindly remembrances. I remain

Yours Sincerely,

Emma J. Cole

**LETTER 26**

Grand Rapids, February 21, 1903

Mr. Fernald.

Dear Sir:

I take the liberty to send you two species of plants which were collected from a field on which Felt-boot factory refuse had been used as a fertilizer at least ten years ago. I am very much interested in collecting these plants from this dry sandy spot and have found

fifteen species. It gives me an idea as to seeds which cling to the wool of sheep and can undergo the processes of the factory and grow here.

I have read your article on the Cranberries in *Rhodora* and have found all three – *V[accinium] Oxycoccus*, *V. oxycoccus intermedium* and *V. macrocarpon* in my own herbarium collected about here. I shall take notice of their occurrence about here in the spring. If you will kindly identify my plants and return, as they are all that I have. The field had been mown and these came from the second growth.

Sincerely yours,  
Emma J. Cole

#### LETTER 27

Grand Rapids, January 21, 1904  
Dear Dr. Robinson.

Last summer and autumn I was in Europe traveling with friends, and I collected plants in the British Isles which I can identify by Hooker's student's flora [Hooker 1884]. Now how about my collections in France, Germany, Switzerland and Italy? Are there in these countries floras similar to Gray's [Gray et al. 1890] and Hooker's in the language of the country I mean? Will you kindly give me names of Floras (with the comparative price)[?] I wish to identify my collection as far as possible myself. I have about four-hundred specimens in all. One hundred sixty from the British Isles which I have just been going through. Any information upon this subject will be gratefully received. I suppose you are well and as busy as usual. I am in school again and my work goes all the better for having left it for a while after twenty-three years of constant service.

My best wishes to yourself and your assistants for the New Year which we have just entered.

Sincerely Yours,  
Emma J. Cole

#### LETTER 28

Grand Rapids, November 1, 1907  
Dear Dr. Robinson

I have about finished my observations on *Arisaema Dracontium*. I spoke to you about my study of it when I saw you several years ago. You may have forgotten it however. If you can command the time will you kindly look over the manuscript which is not long and suggest other observations and criticise [sic] savagely the manuscript with its observations. I have not quite finished my observations, but you may think of others which would be interesting. I will also inclose [sic] the photographs so far as I have them.

I hope I do not solicit more than you with limited time will feel [or find] to grant.

Sincerely yours,  
Emma J. Cole.

[Note: This letter regarding Emma Cole's manuscript on *Arisaema dracontium*, then under preparation, was sent to Dr. B. L. Robinson, then editor of *Rhodora*, journal of the New England Botanical Club. The article was not published during her lifetime, but was ultimately published in the first volume of *The Michigan Botanist* (Cole 1962). E. G. Voss, editor of the journal, discovered the manuscript among the effects of Dr. Harley Harris Bartlett (1886–1960), late professor of Botany at the University of Michigan, while clearing out his office. Voss added a footnote to her article indicating that the manuscript required almost no editorial changes. This letter helps explain this "anomaly" of Voss making few editorial changes, as he was well known to have an especially critical editorial eye. Surely B. L. Robinson complied with her request to "savagely" criticize her manuscript; one only wonders why it had not been published in *Rhodora* back then.]

APPENDIX 2. Letters from Emma Cole to her proofreader, Luther Samuel Livingston (1864–1914). Transcribed from unpublished handwritten letters in Gray Herbarium Archives, Harvard University Herbaria Botanical Libraries (photocopies obtained by J. Stivers on March 13, 2007). Luther, an alumnus of Grand Rapids City High School, Class of 1881, was by 1900 a rare book dealer and bibliographer in New York City who had also worked for Pitcher & Manda's The United States Nurseries in Short Hills, New Jersey, as a compiler of horticultural catalogues, and was sent by his employers as a collector of live orchids in Colombia. He proofread the entire manuscript of Cole's *Flora*. As he was proof-reading sets of page-sheets, it prompted him to reminisce about some of his botanical forays in the Grand Rapids area and to provide handwritten notes on several plants he had collected or observed in 1885 and later (see below after Cole's letter June 15, 1900).



FIGURE 5. Luther S. Livingston, Grand Rapids City High School Yearbook *Delphian* 1896, representing 15-year reunion, Class of 1881 (Photo 1896; source: Grand Rapids History & Special Collections, Archives, Grand Rapids Public Library).

**LETTER 1**

Grand Rapids, December 24, 1899  
Luther S. Livingston.  
Dear friend.

The "Flora" I hope will soon be in the hands of a publisher and I have in kindly remembrance "a promise," that if possible you would assist me in looking over the proof. Are you too busy to do so? It will come in 16 pages or its equivalent about once in two weeks or so. I shall esteem it a great favor if you can do so as I have never read proof. I will struggle along with the first if you think best. Do not let me interfere with your plans if it will not be perfect convenient.

Yours,  
Emma J. Cole

**LETTER 2**

Grand Rapids, February 23, 1900  
Luther S. Livingston:  
Dear Friend.

I include the proof of the first sixteen pages of the Catalogue. I am having this printed first as the Introduction will be comparatively easy for the printer. It gives me so much courage to know it will pass through your hands before it passes to the printed page and thence to the world.

The diphthongs I have printed as single letters and the comma between the species and its authority I have omitted following Dr. Britton in these respects at the advise [sic] of Prof. Wheeler of the M.A.C.

The nomenclature is that of the Kew Index which in the main is that of Gray. When it differs, that of the Gray is in parentheses. The Britton & Brown [synonym] is in italics. When the change would be simply a gender ending it has not been added.

I shall have it printed on book paper (without gloss) and I hope it will come out satisfactory to everyone interested. I hope you will feel free to suggest or make such changes as you think would be a benefit.

I thank you most heartily for your assistance and I hope I am not asking too much with your limited time. Remember me to Mrs. L. and tell her I know she will be vexed to have me trespass upon her husbands [sic] leisure, but that it will not last forever as there are only 1309 species in the Flora.

The plants with a catalogue number are supposed to be established. Those without a number are here but adventive.

In the Catalogue I have mentioned your name to your notes instead of initials as I have done in the cases when the name appears occasionally.

Yours sincerely,  
Emma J. Cole

**LETTER 3**

Grand Rapids, March 18, 1900  
Dear Luther.

After much delay my proof is in page form. You need not apologise [sic] for criticism. This is just what I desire. I hope you will always feel free to do any amount of it. I know you feel interested in the publication and are anxious to have it come out all right. I feel that you go through the proof in the most thorough manner. You do not glance it over and



return it with all its mistakes. You are just the proofreader I need and I feel, after it has gone through your hands, a confidence in it. I have never read proof or superintended publication so I have many things to learn. I have acted upon your suggestions as far as I have been able to do so.

About the intending [sic] we have all talked and thought about it, but have concluded it will look none the better in the whole. I have set the number [of the species] out which relieves somewhat the square front. The lines are many times short and the right hand page will be broken at first.

The common names I have taken from Gray and have printed them after his method. You see I cut up Mich. Floras and pasted the names on cards to aid my printer, as my writing is not legible [sic] at best. As to the genera credited to Linn. instead of L. they were so given in the Kew – and it really makes little difference. All the same I want your suggestions whenever you notice anything in this line. I hope my work will progress a little faster now the Covered Count is about through. My printer works on briefs &c.

Miss Dean is well. Miss Clark is in the City and will remain till summer I think. I talk to your sister Jennie through the Phone occasionally. We are having our winter now, a real blizzard. School goes off nicely, but my classes are larger than in the fall. I hope you and Mrs. L. may visit G.R. before many months, and that I may have the pleasure of entertaining you. If you will look over the proof – suggest, and return as soon as possible. I shall be greatly indebted to you.

Sincerely your friend.

Emma J. Cole

P.S. The printer has added from 107 to make up the 16 pages. Will you be so kind as to look these over.

Yours, E.J.C.

#### LETTER 4

Grand Rapids, April 10, 1900

Dear Luther.

I send a few more proof sheets, also a copy of the first sixteen pages. I thought you might wish to look back for some things for uniformity, so mark this up as you wish and I will send you a copy friend [unclear, bound?] when it is all complete. The Rouge River was so called because of its reddish water, but soon became pronounced rouge because at Plainfield so many reckless characters gathered, but it still retains its original spelling.

We are having fine weather here now. The robins are singing and the maples are coming into bloom.

Yours sincerely,

Emma J. Cole

#### LETTER 5

Grand Rapids, May 12, 1900

Dear Luther.

Inclosed [sic] find more proof. My printer is slow you will see but he wants everybody else to get in a “hustle” so if you will return this as early as possible it will please him. He says you have “awful sharp eyes” to see all the errors. I hope you will continue to have [eyes] for I am not used to proof but I see I am improving. You will see that the “Cs” are out but I will see that they get in in their proper place. I telephoned your sister Jennie yesterday. She is well. When do you go to N.C.?

Yours,

Emma J. Cole

### LETTER 6

Grand Rapids, May 24, 1900.

Dear Luther.

Here is another set of proof. I will give you a credit mark for your promptness. The notes pertaining to yourself and Bert [Burton Livingston], feel free to change or correct as you think best. My printer is willing but not so responsible as he might be for his own work, yet it seems to be coming out fairly well with all the work I have done upon it by my friends. I left the “¼” as Mr. Fallass thought it was a little better so than written out, but I thank you for the suggestion. He has much of his work as a lawyer. Correct or criticize freely.

Yours,

Emma J. Cole

[over]

M[r]. Railuel [sic] found *Arisaema Dracontium* in 1891. I visited the spot in 1898 and it was still there. The creek bed has turned and it is left on a kind of island, so the cattle will not be able to destroy them.

E.J.C.

[Note: Cole has the name as “Edward Raiguel” in the *Flora* under *Arisaema Dracontium* (p. 39).]

### LETTER 7

June 15, 1900.

Dear Luther.

Your letter with those delightful notes came to hand in due time. I could feel just how you went in memory from place to place with your brother Lincoln and enjoyed the scenery, the birds, butterflies and flowers. I shall incorporate all of your notes with my data and they will be put aside for reference. I wished so much to put in your brother’s name but I could find no convenient place without leaving out your own and this I did not wish to do. The plants which do not grow in our district (within the tiers of townships about the City) I do not give a number, but several grow only a few miles without so I inserted them without a number—and those plants not considered established it is customary not to number. Then the Catalogue does not seem padded to give a large flora. Ours is 1263 with numbers. So you see we have probably the largest flora for the territory in the State. Professor Wheeler thinks so. I forgot to write you about my plan of numbering in my last letter. I hope my proofs will not come so long apart during vacation[;] the printer I think will have more time to give to my work then. Please return as soon as possible.

Yours sincerely,

Emma J. Cole

P.S. Is sand bar a compound word?

### Luther S. Livingston Notes

Luther S. Livingston sent the following notes, which Emma Cole’s letter of June 15 (above) refers to as “those delightful notes.” Some numbers from the proofs written by Luther’s hand were changed in final printing; the correct numbers, as they appear in the *Flora*, are in brackets; Also added in brackets are common names and current scientific names (per MICHIGAN FLORA ONLINE 2011):

## 373 E[rythronium] albidum [White Trout Lily]

In the Spring of 1885 I gathered quite a bunch of flowers, 40 or 50 blossoms I should say now, in the field in the north west angle of the junction of the Lake Shore and C. & W.M. [R.R.]. The "Thoas" field we called it because there, in the summer of 1880 E. A. Rennick and myself had captured specimens of a *Papilis* unknown in that region for twenty years and which we identified as *P. Thoas* (tho' it was *P. Cresphontes*). It afterwards became common.

[Note: This was *Palilio cresphontes* (Giant Swallowtail), similar to *P. thoas* (Thoas Swallowtail).]

## 376 L[lilium] Philadelphicum [Wood Lily]

In the summer of 1885 I gathered these on the hill above Cedar Swamp.

377. L[lilium] superbum [Michigan Lily, now *L. michiganense*]

In the summer of 1876 I remember that in the swamp west of the C. & W.M. [R.R.] just below Plaster Creek there was a most notable patch of these lilies very tall and with immense spikes. We gathered them there in after years also but they gradually died out.

390 [389] *Tofieldia glutinosa* [False Asphodel, now *Triantha glutinosa*]

Gray has this *T. glutinosa* Willd. [instead of "(Michx.) Pers." in the *Flora*]

394 [392] *Trillium* rivale

For a number of springs, certainly from 1882 to 1886 my brother Lincoln and myself annually gathered these on the north bank of Plaster Creek between the M. C. and G. R. & I. [RR]. For most of these years if not for all it was our earliest flower preceding *Hepatica*, *Ranunculus* or *Erigenia*. In my mind now I can see exactly the position in which they grew, and most abundantly, in thickets where the dead leaves showed that during high water the creek had flowed over the ground. Prof. Moseley was with us when he gathered them in 1885. This little *Trillium* was one of my favorites. I never saw it elsewhere and have not seen it since I left G. R.

402 [400] *Arethusa* bulbosa [Arethusa]

The first I saw were gathered by my brother Lincoln in the spring of 1882 or 1883. We gathered them every spring as long as I was in G. R. They grew in the soft mounds or cushions of living sphagnum, never were very abundant but, I presume we have gathered 30 flowers in a season.

I think "In sphagnum in Orchid S[wamp]." would be better than in bogs because they did not grow in really boggy places as did the *Calopogon*, for instance.

Note: [Emma took his advice. She added to her *Flora*: "L. S. Livingston and Prof. R. H. Wolcott report this species as having been rather abundant in this swamp [Orchid Swamp—now extinct] in the eighties. In 1898 seven plants were found (O.H.) [Homer Skeels & Jennie Shaddick, Our Herbarium]."]

403 [401] *Calopogon* pulchellus [Grass Pink, now *Calopogon tuberosum*]

The east margin of the lake in Orchid Swamp was red with flowers so they could be gathered by handfulls in 1882 to 1885 or 1886.

## 406 [04] C[yrippedium] acaule [Moccasin Flower; Pink Lady-slipper]

In 1885 my brother Lincoln B. L. found a specimen in Saddle Bag Swamp with a double lip, the lower flattened the upper inflated and resting upon the lower. One lip was not within the other. The next day I went out there and gathered a basketful, certainly 200 or 300 of the blossoms. They were all in a little patch of tamaracks south of the R.R. track and growing in the mude [muck] ground around the roots of the trees. Between the trees was water in which I waded in gathering the flowers. Here in the East I have gathered them up the Hudson [River] near Cornwall [N.Y.], near Short Hills, N. J.,] at Atlantic Highlands [N. J.], on Staten Island [N.Y.], and in Western North Carolina, always in high dry situations.

## 407 [405] C[yrippedium] candidum [White Lady-slipper]

My memory is perfectly clear as to this. I could go to the exact fence corner and the exact bush (now gone or a tree) under which I found those plants. Only a day or two before I had first found them, and Oh? in what abundance in the low ground West of Lamberton Lake. There I had gathered a basketfull [sic].

408 [406] C[yrippedium] parviflorum [Small Yellow Lady-slipper, now *C. parviflorum* var. *makasin*]

I gathered a large bunch (thirty or forty stems I should say) in Cedar Swamp in 1885.

409 [407] C[yrippedium] pubescens [Yellow Lady-slipper, now *C. parviflorum* var. *pubescens*]

Where one of the hills was cut through by the DGH&M RR about three miles out on the R.R. property beside a telegraph pole there were four or five fine large plants each having from 20 to 50 flowers. We gathered the flowers two or three years (1882 to 1884 or thereabouts) and some of the plants flourished in our garden for several years.

410 [408] C[yrippedium] spectabile. [Showy Lady-slipper, long known as *C. reginae*]

More than one year I have gathered an armful of these fine orchids in Orchid Swamp. 1882 or 1883 to 1885–86. Even as late.

412 [410] H[abenaria] blephariglottis [White Fringed Orchid, now *Platanthera blephariglottis*]

We gathered this in large quantities growing in living sphagnum in Saddlebag Swamp from 1885 to 1887.

414 [412] H[abenaria] ciliaris [Orange Fringed Orchid, now *Platanthera ciliaris*]

This was never abundant but annually for five or six years 1881 or 1882 til 1887 we gathered a few spikes in the triangular point of Orchid Swamp as you first enter from the road. It was not really swampy there but among the ferns and huckleberry bushes were a few plants. Farther down the road, along the foot of the hill just before you come to the first fence, just along the lower edge of the road among tall ferns were a few more plants.

It was in a similar situation along the East Edge of Button Lake [Emerald Lake] (at the foot of the hill, along the lower side of the road) that I gathered them in 1885.

415 [413] H[abenaria] dilatata [Tall White Bog Orchid, now *Platanthera dilatata*]

On a little hummock a foot or two from the bank, at the end of the lake near the hill in Orchid Swamp, I found two spikes of this orchid in 1885. I so classified it and I am sure now that it was correct. It is possible that Burt still has the specimen. The flower had a most delightful spicy odor like many of the tropical orchids.

[MICHIGAN FLORA ONLINE (2011) states: "The flowers have a strong spicy fragrance, suggestive of cloves."]

421 [419] H[abenaria] psychodes [Purple Fringed Orchid, now *Platanthera psychodes*]

We gathered fine specimens year after year along the M. C. RR. south of Burton Ave.

427 P[ogonia] ophioglossoides [Rose pogonia]

In the good old days this was abundant in Saddlebag, blossoming with H[abenaria] blephariglottis [now *Platanthera blephariglottis*].

L. S. Livingston  
[June 1900]

#### LETTER 8

Grand Rapids, July 17, 1900

Dear Luther.

I hope you will not forget my proof this time. I waited as long as I could for the last proof, and began printing, but fortunately I got your corrections in. By an error in giving the wrong manuscript I have some plants in Leguminosa [Leguminosae = Fabaceae] before Rosaceae is finished, but there will be less to look over next time.

Yours,  
Emma J. Cole

#### LETTER 9

Grand Rapids, August 18, 1900

Dear Luther,

Will you be so kind as to run over the printed pages and note the corrections which should go in the errata at the end of the catalogue. I presume the scientific terms are in the main correct. You need not hurry but when you find time just glance it through. I pity you in this unique heat.

Yours sincerely,  
E. J. Cole

P.S. Please be as prompt as the last two times if possible as I wish to go in the country.  
E.J.C.

#### LETTER 10

Grand Rapids, October 26, 1900.

Dear Luther:

If you can begin the looking over of the printed part of the catalogue for errors, at your leisure and be ready by the time the two proofs after this are ready, which we hope will be finished by Dec. then you can report with the last catalogue proof. The common names

included with the synonym should have been out of the parenthesis but it was not noticed until it got in several times, and as it will not probably occur more than twice more, I thought it best to have it uniform. I am sorry I did not notice it at first. We are having beautiful weather. You would enjoy our woods now.

Yours Sincerely,  
Emma J. Cole

#### LETTER 11

[Grand Rapids], November 19, 1900  
Dear Luther.

If you have the errors noted you may send them so far as completed with the proof. I congratulate you on the prospect of such a delightful time.

Yours Sincerely,  
Emma J. Cole

#### LETTER 12

[Grand Rapids], November 24, 1900  
Dear Luther.

I hope you will see me through the Preface and Index. Your "sharp eyes" always see some errors that I have overlooked. Would you index to all the common names (e.g.) Quercus, Oak are both necessary but is white oak, black oak &c. in so small a "list" as this? I congratulate you in your new home. I know you will be very happy with so much of God's own earth about you. Miss Dean has taken her place for half day work in the Central again. Miss Clark is at the \_\_\_ [unintelligible] and is having trouble with her eyes. So she feels somewhat lonely.

Yours,  
Emma J. Cole

#### LETTER 13

Grand Rapids, January 7, 1901  
Dear Luther,

Inclosed [sic] please find my Introduction. I hope you will feel free to criticise [sic] where you think it needs it. What do you think of the size of the headings and then subdivisions. There are about four pages more, mostly on summing up & explaining the Catalogue. I inclose [sic] a rough outline of my cover to be printed on a gray drab in black.

Yours,  
Emma J. Cole

#### LETTER 14

[Grand Rapids], January 26, 1901  
Dear Luther,

You need make no apologies for your criticisms. They are just what I need and desire, and I should be vexed with you if you were not frank. So make as many as you think the proof needs. I want it as good as I can make it.

Bert [Burton Livingston] sent in his article published in the Botanical Gazette. It is

fine. He is real scientific and scholarly and I am proud of him. Soon you will hear the birds in your trees and the breath of spring will be with you and you will be very happy in your "wild" wood home." I inclose [sic] copy of cover and title page. Make any suggestions you wish.

Yours sincerely,  
Emma J. Cole  
[over]

What do you think of the type of statistics of the Catalogue[;] is it in the right place (ie[.] the statistics?)

Should I make explanations of the Plan of the Catalogue one of my general headings as, Climatic Influences &c., Geology, [T]opography and Soil?  
E.J.C.

[Note: Regarding his "wild" wood home: "In 1898 Luther married Flora V. Milner of Deer Lodge, Montana, a friend of his boyhood. Mr. and Mrs. Livingston made their home at Scarsdale, nineteen miles north of New York City. There he found three acres of woods, cliffs, swamp, and proper soil for the garden into which he put the happiest part of every week. Under his wizard touch, this little country home lot became a botanical museum" (Winship 1914).]

#### LETTER 15

Grand Rapids, March 20, 1901  
Dear Luther.

Would you like on the Cover the "Grand Rapids Flora" printed in dark heavy plain letters better than the fancy type?

On the title page would you place "Grand Rapids Flora" so near the top of the page? Do printers punctuate the cover and title pages now?

Say all you like by way of criticism. The cover will be a drab gray I think.

Yours,  
Emma J. Cole

#### LETTER 16

Grand Rapids, April., 10, 190[1]  
Dear Luther,

Your letter came yesterday and it is a satisfaction to know you think my Flora very creditable. When I began the work I had had no experience in a printing office. Had I had as much foresight as I have had now of experience, I fear I should not have attempted it. It has come out very well, for I have had the very best assistance I could have had.

The cash outlay for map and printing was about \$226.00. My expenses for my summer vacations, horse hire &c. brings it to about \$550.00. The books are listed at \$1.00 net and Lyon, Kysner & Palmer have the selling of them.

It is expected that libraries will purchase them, and small numbers of copies will be used as reference in the surrounding counties. My pupils will buy a few copies, especially those who wish to make collections or continue the work. Copies will be placed in private libraries, but the sale will be limited and the thousand copies are supposed to be sufficient to supply the demand for the next half century.

Systematic botany is not in its "palmy days" at present, it is now considered not "up to date." But it is in my judgement [sic], the right way to interest young people in the study of nature, the influences of the woods, the flowers and the fields will be life lasting. It was

not a financial speculation on my part that led me to publish the Flora. I could do it, and I felt owed it to the department. I have enjoyed preparing it and as time passes the little annoyances of publishing will have passed away and the memories of the past six years of collecting material for its publication will be among the very pleasantest of my life. Your letter came too late to use your advice about the word "Catalogue" in the title page, as to Mr. Van Dort's name, I promised him when I made my agreement with him that his name might appear there so I must keep my word. He quite prides himself on the mechanical work of the book. I think the notice in the Press pleasant so send it to you, also one of the circulars; you see I have so little fame that I must tie to my friends who have it. I wish to express my sincere thanks to you for your kindly assistance. You can never know how much it has helped and comforted me during the past fifteen months. I mailed a copy of the Flora to Bert [Burton E. Livingston], he thinks it will be quite helpful in his next summer's work in the county. The State Geologist wished two copies. The spring is very late in bringing forth vegetation. The Skunk Cabbage is out but the hepatices in our garden are in their sheathing bud-scales and they are usually out before those in the woods. The arbutus is still in bud. I hope you will kindly preface my correspondence with you regarding the Flora with ample apologies, for, if it goes down to your posterity, I fear my scribbling will not be looked upon so kindly as it has been by their forefather. My closest friends have long warned me against my careless manner of writing, but of no avails and lo, now my retribution is surely, is surely at hand.

I hope my correspondence with you will not cease now that the Flora is completed. I shall always be very glad to hear from you and of your prosperity.

Kindly remember me to Mrs. L.

Sincerely your friend.

Emma J. Cole



APPENDIX 3. Letters from Dr. Charles S. Sargent (1841-1927), Director, Harvard University Arnold Arboretum, to Emma Cole. Sargent served as the first director of the Arnold Arboretum and is especially known for his 14 volume *Silva of North America* (1890–1902) and *Manual of the Trees of North America* (first edition 1905, second edition 1922). During this time of correspondence with Emma Cole, Sargent was especially focusing on the difficult and diverse genus *Crataegus* and greatly appreciated her assistance in these studies. Typewritten copies of unpublished letters in the Correspondence of C. S. Sargent, Archives of the Arnold Arboretum of Harvard University. (Photocopies obtained by J. Stivers on January 26, 2007).



FIGURE 6. Dr. Charles Sprague Sargent, Director, Harvard University Arnold Arboretum (Photo ca. 1910; source: Arnold Arboretum Horticultural Library of Harvard University).

### LETTER 1

Grand Rapids, May 1, [1906]

My dear Miss Cole:

I am back again after a splendid journey in South America where I have enjoyed myself immensely and obtained a good deal of useful material for our herbarium. Now that I am back I have got to think about *Crataegus* again. I want if possible to be able to get out next winter a paper on some of the Michigan species, so if there is any more work to be done in your region this season I hope you will do it, and, if you can extend the region, so much the better.

Let me hear that you are well and still enthusiastic about *Crataegus*.

Faithfully yours,  
C. S. Sargent

**LETTER 2**

Walker Station, August 23, [1906]

Dear Miss Cole:

I am very pleased to get a letter from you again and to learn that your health is restored as well as your zeal for botany.

I have been working a good part of the summer on very large collections of *Crataegus* from the neighborhood of Buffalo and Niagara Falls, and from different places in Ontario. I have done about all I can on these so far and now have commenced on Dodge's collection. What I should like to do, if possible, is to combine your plants with Dodge's into one Michigan paper. I mean to go out to see Dodge this autumn if I can, and it may be desirable to pay Grand Rapids another visit. It would certainly be a great pleasure for me to do so.

I am most anxious to get all this material that has been accumulating for so long off my hands, especially as so many of your species are now growing in the Arboretum, but as the number of described species increases the difficulty of describing new ones becomes greater. Altogether the situation is becoming difficult. Fortunately I am in good condition this summer in spite of the heat which has been uncomfortable owing to too much moisture. When do you expect to be back in Grand Rapids?

Faithfully yours,

C. S. Sargent

**LETTER 3**

Grand Rapids, January 22, [1907]

Dear Miss Cole:

I am now working on a paper about Michigan Thorns and I shall try to include in it some of the most distinct of your Grand Rapids' species. Names are very hard to find, so possibly you can give me the names of some individuals who have been in some way or other connected with Grand Rapids' botany whose names might be used for the names of species. How about the man who wrote *The Flora of Southern Michigan*, published by your Academy, which you got from me the other day? If you can send me half a dozen appropriate names, they will be of great help.

Faithfully yours,

C. S. Sargent

[Note: The man referred to here is Nathan Coleman, who spent two years teaching in Grand Rapids and, at the request of the Kent Scientific Institute, researched and published a catalogue of the flowering plants of southern Michigan (Coleman 1874). For additional information see Lammers (2016) and Crow (2017).]

**LETTER 4**

Grand Rapids, January 23, [1907]

Dear Miss Cole:

Your # 61, a *crus-galli* species, I used to consider *C. Crus-galli*, Linnaeus. Now that species is broken up it may be something else. Can you tell me the color of the anthers? Unfortunately I have no note of this.

Faithfully yours,

C. S. Sargent

## LETTER 5

St. Louis, Michigan, January 30, [1907]

My dear Miss Cole:

I am distressed indeed to hear that you are laid up and under treatment. I hope a long rest will do you good. I am sure it will. It won't do for you to get sick now just as we are getting on to work on Michigan *Crataegus* in earnest.

I am describing a few of your most interesting species but there are many that I do not want to take up until after I have visited Grand Rapids again. This I ought to do next autumn, but of course if you are not there it would be useless for me to try to find your numbers, so it seems to me that it is up to you to get well and get back all your *Crataegus* enthusiasm. Drop me a line sometime and let me know how you are getting on. Your handwriting does not look as if there was much the matter with you.

Faithfully yours,  
C. S. Sargent

## LETTER 6

Grand Rapids, February 13, [1907]

My dear Miss Cole:

I believe that I have done now all that I can do to the Michigan *Crataegus* paper this year and I shall soon send it to the Michigan Academy which meets next month. It contains 54 species; of these 20 are now first described, and 19 have been previously imperfectly described by Ashe and are re-described by me in this paper. Altogether there are 32 of my species and 3 by older authors. The following are of your collecting:

- C. attenuata*, Cole 16 and 19,
- C. perampla*, n. sp., Cole 76 type,
- C. horridula*, n. sp., Cole 138 type and 79,
- C. parvula*, n. sp., Cole 120 type,
- C. latisepala*, Ashe, Cole 170 and 170-1
- C. bellula*, Cole 135,
- C. allecta*, n. sp., Cole 18 type, 70, 139 and 146,
- C. merita*, n. sp., Cole 29 type, 30 and 31,
- C. perlita*, n. sp., Cole 132 type,
- C. mollipes* n. sp., Cole 191 type,
- C. pura*, n. sp., Cole 26 type, 149-1, 155,
- C. Wheeleri*, n. sp., Cole [handwritten insert] 103-1, type,
- C. pusilla*, n. sp., Cole 66-2 type, 66-1, 66-3,
- C. Bealii*, n. sp., Cole 116 type, 116-1, 46, 46-1, 103,
- C. Dodgei*, Ashe, Cole 126, 126-1,
- C. urbana*, n. sp., Cole 3 type, 3-1, 3-2, 6
- C. Coleae*, 8-1 type,
- C. honesta*, n. sp., Cole 4, type, and 5,
- C. pinguis*, n. sp., Cole 161 type, 162, 164, [spelled *C. pinguis* when published]
- C. tomentosa*, L., Cole 11 and 42.

You see that this leaves many of your numbers undescribed, especially in the *Pruninosae*, of which you made a very large collection, and in the *Intricatae*. You will notice that I have already described three new species of *Intricatae* but I suspect that you have two and perhaps three more. This group particularly needs further study, as does the Pru-

inosae and Tenuifoliae. In fact Grand Rapids is one of the best places I know now to further investigate *Crataegus*.

I hope that this will find you very much better in health and I shall hope to hear that you are soon returning to your home entirely restored and ready for a record-breaking *Crataegus* campaign.

Faithfully yours,  
C. S. Sargent

[Note: see Crow (2017) for updated taxonomy of the genus *Crataegus* for the Grand Rapids area, including taxa published subsequent to the appearance of Cole's *Flora*.]

#### LETTER 7

Grand Rapids, April 19, [1907]

Dear Miss Cole:

I hope you have recovered and are back in Grand Rapids and ready for some botanical work this spring. There seems to be still considerable to do, and if I hear that you are in condition for some light spring work, I shall write you in detail just what is needed.

I have not heard anything yet of the proof of my Michigan article but I daresay it will be here before long.

Faithfully yours,  
C. S. Sargent

#### LETTER 8

Lowell, May 6, [1907]

Dear Miss Cole:

Your letter of the 24<sup>th</sup> of April was duly received. I am sorry to hear that you had to give up your school because I am sure that you will miss the work, still your reasons for doing so seem to be good.

I have been looking over again some of your Grand Rapids' material and I find that there is special work to do in the *Intricatae*. I have described three species in this group collected by you at Grand Rapids, but I have the following material which I could not satisfactorily refer to any of the three.

- # 69, stamens 10, anthers white.
- # 45, stamens 10, anthers pink.
- # 68, stamens 10, anthers pink.
- # 101, stamens 10, anthers white.
- # 102-3, stamens 10, anthers white.
- # 106, stamens 10, anthers white tinged with pink.
- # 110, stamens 10, anthers pale pink.
- # 116, no flowers.
- # 113, no flowers.
- # 25, stamens 8 to 10, anthers pale pink.
- # 66, stamens 8 to 10, anthers pale pink.

I think that if you are able to do so it would be a good plan to make a study of all the plants in this group, comparing them carefully as to the number of stamens, color of the anthers, etc., and, if necessary, remarking them, then in the autumn if I am fortunate

enough to be in Grand Rapids we can go over the plants again. It is especially important to collect flowers of those numbers of which flowers have not been collected.

In other groups I am interested in 148, a mollis species with ten stamens and red anthers. No fruit of this has been collected. It seems to me to be undescribed.

In the Flabellatae # 5, with five to ten stamens and purple flowers, also seems to be new. There is no fruit of this. Of # 28 in the Flabellatae there are no flowers.

In the Pruinosae there are flowers of 60 and 117.

In the Tenuifoliae there are no flowers of # 3 collected by you and me September 23 1901; and of # 75, also collected by us September 25, 1901, there are no flowers.

Besides the above you have many Pruinosae that have not yet been determined, but of these we seem to have abundant material of both flowers and fruit. I shall want to see the plants again, however, before finally deciding about them. Do not undertake to do too much work but, if you can, get the flowers of numbers [of the specimens from the specific trees] of which flowers have not been collected it would be well to do so.

The Intricatae Group is especially interesting to me because you have so many species and because this is a group which is mostly confined to the Atlantic states. Your region is the furthest west, with the exception of a station for one species in Missouri.

Faithfully yours,  
C. S. Sargent

#### LETTER 9

Lowell, June 19, [1907]

My dear Miss Cole:

I am very pleased to get your letter of the 16<sup>th</sup> and to hear that you are progressing so well and have been able to continue your botanical work. Many thanks for your information about the various numbers.

Your number for what I call *C. mollipes* is 121, not 191.

103-1 which you ask about I do not seem to find; nor do I find any # 75 except that collected by you, a Pruinosae species with ten stamens and purple anthers.

I am going abroad in a few days for a short absence in England and I think you had best hold on to all the material you have collected this spring until the autumn, when I shall hope to see you that we may settle up in the field a few of the questions still unsettled relating to your species.

I hope you will have a very pleasant summer and continue to improve.

Always faithfully yours,  
C. S. Sargent

#### LETTER 10

St. Louis, Michigan, August 16, [1907]

Dear Miss Cole:

I am back from Europe and have begun to write out descriptions of your undescribed Grand Rapids material so that I can take them with me this autumn in case you are able to devote a day or two to going over your numbered plants with me again.

In writing a description of your # 75, a pruinous species, with ten stamens and pink anthers I find that a flowering specimen collected May 18, 1903, has leaves that are broad and rounded at the base, while the fruiting specimen of this same number collected October 1st, 1904, has leaves narrowed and cuneate at the base. This fruiting specimen looks

as if it might be a small-leaved *C. bellula* although the fruit is rather more obovate. Is there not some error here?

I hope you are quite well again and ready for a little more work. I feel strongly that we ought now to finish up all the material which you have been collecting and studying for so many years in the neighborhood of Grand Rapids. As you know, many of your species are already described in the Michigan paper which I had hoped to find here but which apparently has not yet seen the light of day, at least so far as I know.

Faithfully yours,  
C. S. Sargent

#### LETTER 11

Grand Rapids, August 31, [1907]

Dear Miss Cole:

I wrote you a couple of weeks or so ago on my return from Europe but as I received no reply to my letter I am afraid it did not reach you.

I am anxious that you should meet me at Grand Rapids about the 22d of September and go over with me in the field your numbers which are still undescribed. Of course if you cannot do this, it would be useless for me to go to Grand Rapids as I could never find your numbers. I have already written out preliminary descriptions of all the plants I want to see, so it ought not to take so very long over field notes.

Please let me hear from you as soon as possible.

Faithfully yours,  
C. S. Sargent

#### LETTER 12

Lowell, September 4, [1907]

Dear Miss Cole:

I have written you two letters. The first one was wrongly addressed and has been returned. Perhaps it is not time for an answer to the second which I sent to Grand Rapids. Now Dodge writes me that you are at Lowell, Michigan, so I send this line there to tell you that I count on your meeting me at Grand Rapids about the 22th for a day or two over some of your *Crataegus*. I have written out preliminary descriptions of all your numbers that are not in my first Michigan paper, so that if you can still find the plants it ought not to take very long to do what I have to do there. Of course if you cannot meet me it will be hopeless for me to go to Michigan this year, but I very much hope that you can as I am anxious to finish up now the Grand Rapids species.

Faithfully yours,  
C. S. Sargent

#### LETTER 13

Lowell, September 5, [1907]

Dear Miss Cole:

I am glad to hear that you are in such good condition and ready for *Crataegus* work this autumn. The numbers of which I have written out descriptions are,—

3-1, May and Sept. 1905. # 32, Sept. 1902, and May and Oct. 1905, seems to be the same.

3-2 and 3-3, May 20 and Oct. 3, 1901.

32, May 1901, May and Sept. 1904. 158, Oct. 17, 1904, seems the same.  
 117, May and Sept. 1901, June 1907. # 60 is probably the same.  
 32-1, May and Sept. 1905.  
 142, Sept. 1901, May 1903, Oct. 1904.  
 80, May and Oct. 1905.  
 157, Oct. 1904, May 1905.  
 168, May 32 [sic—probably May 5] and Sept. 20, 1905.  
 86, May and Sept. 1902. # 44, Sept. 1902 and May 1903, seems to be the same.  
 75, May 1903 and Oct. 1904. # 168, May and Sept. 1905, is probably the same. # 74,  
 flowers only, is also probably the same.  
 37, May and Sept. 1902.  
 13, May 1901, Sept. 1902.  
 124, Sept. 1901, May and Sept. 1902[.]  
 151, Sept. 1904, May 1905.  
 12, May 1901, Sept. 1902.  
 38, May and Sept. 1902.  
 1 Sept. 1900, May 1901 and Sept. 1902.  
 5, May 24, 1904. # 147 of 1903 and 49, May 1905, appear to be the same. There is no  
 fruit of any of these numbers.  
 167, May and Sept. 1905.  
 148, May and Sept. 1904.  
 102-3 and 113, Sept. 1904, June 1905.  
 45, June 1901, Sept. 1902.  
 69, May and Sept. 1901, Sept. 1902.  
 110, 106, May and Sept. 1901.  
 06, 25, May 1901, Sept. 1902, May and Sept. 1902, Sept. 1904.  
 94.x[?], May and Sept. 1901.

These numbers are all of which I have written descriptions. We ought, however, to look at the following: 96, 36, 22, 15, 125, 116-1. So you see we still have a good deal to do.

Would it be all right if I telegraphed you to Lowell a couple of days before I expect to reach Grand Rapids? I now expect to leave here September 16th before and stay a few days in western New York, so it may be the 23rd or 24th before I can get to Grand Rapids.

Faithfully yours,  
 C. S. Sargent

#### LETTER 14

Grand Rapids, October 29, [1907]

Dear Miss Cole:

I am delighted to get your note and to hear of you in such good condition, and especially that you got no cold in those two stormy days. After I left you I went to St. Louis [MO] and stayed several days and then went into the southwestern part of the state where I had a successful time, although owing to late frosts the early-flowering species bore no fruit.

I am afraid it is too late to make any correction in proofs of the Michigan article. By the way, I have heard nothing of this article. Do you know any way by which I can find out about it? It seems to take a long time in Michigan to get anything printed.

I hope now to be able to complete the Grand Rapids' species this winter, thanks to the information we obtained while we were together. I have been so busy, however, with other matters since I got home that I have not begun yet the winter's work on *Crataegus*.

Always faithfully yours,  
 C. S. Sargent

**LETTER 15**

Grand Rapids, June 16, [1908]

Dear Miss Cole:

I am very much obliged for the package of *Crataegus* specimens which arrived yesterday. I am very glad to see that you are still interested in the genus and willing to help me with it. I hope sometime you will tell me about your experiences in Cuba and whether you did much botanizing there. What are your plans for the summer?

Faithfully yours,  
C. S. Sargent

**LETTER 16**

July 13, [1908]

My dear Miss Cole:

The following is a list of your specimens which have not yet been determined or described:

Pruinosae.

181. This tree has been cut down but seeds have been sown. Do you think that this can be one of the described species?

171. Good specimens and notes.

142, 157. Good specimens and notes.

32-1. Good specimens and notes.

86, 44. “ “ “ “ [ditto marks]

75, 169. “ “ “ “ [ditto marks]

132, 158. Good specimens and notes.

Tenuifoliae.

124. This tree has been cut down but seeds have been sown.

1. Your specimens. [handwritten]

151. We could not find this last year. Seeds have been sown.

22. Seeds have been sown but there are no flowers and no notes.

36. No notes.

125. Seeds have been sown but there are no flowers.

15. Poor specimens. Seeds have been sown.

Molles.

153. No notes but good specimens. Can you furnish notes on habit, etc.? Seeds have been sown.

148, 134. Good specimens and notes.

Intricatae.

110, 25, 66, 106. New species, good material.

13. New species, good material.

178. New species. Flowers were collected too late to obtain the color of the anthers. I hope you will get this next spring.

Tomentosae.

174. New species ? Good material.

This shows that there is very little more for you to do about Grand Rapids in the *Crataegus* line unless you can find more species in some other locality. I daresay it would



not be necessary for you to go many miles away in order to find an entirely new set. If you can help with notes or any suggestions about the above numbers, I shall be very greatly obliged to you.

We are having here the hottest and driest summer I can remember. Everything is burnt up in New England and fires are raging all about. I am hoping to go to England on the 7th of August for a few weeks but shall be back in time for some *Crataegus* work this autumn.

With kind regards, I am,

Faithfully yours,

C. S. Sargent

APPENDIX 4. Letters from Charles Faye Wheeler (1842–1910), Instructor in Botany and Consulting Botanist, Experiment Station, Michigan Agricultural College, to Emma Cole (University of Michigan Herbarium Archives, photocopies provided to Julie Stivers by Dr. E. G. Voss on October 21, 2005; transcribed by Garrett Crow).



FIGURE 7. Charles Faye Wheeler, Botanist, Michigan Agriculture College (Photo ca. 1895; source: Michigan State University Archives and Historical Collections).

## LETTER 1

Agricultural College, Ingham Co., Michigan December 5, 1893  
Dear Friend.

The plants went yesterday. The *Malvastrum* and the *Astragalus* are new to me and I have not yet been able to find any descriptions of them in any books at hand. Will send the names as soon as I am able to find them. I will check the plants on the list and return it in a few days—

In regard to *Agrostis alba*, L. I will say that Botanists now do not consider 1. *A. alba*, L. 2. *A. stolonifera* L. 3. *A. vulgaris*, With. to be distinct sp[.], but forms of one variable Sp. The first form is common everywhere, the panicle may be white to deep purple, this is in Grays' Manual 6<sup>th</sup> Ed. = var. *vulgaris*. No. 2 is in the Manual *A. alba*, L. ~~grows~~ found in low grounds. The panicle is contracted after flowering, ligule long and acute. Not so common. No. 3 = No 1. There sometimes is found a very large form which is named var. *gigantea*, Koch.

Homer Skeels is a good student. We allowed him to enter in advance in botany. He ranked no. 1 in the final Examination.

Yours very truly  
C. F. Wheeler

[Note: Homer Skeels was Emma Cole's student, Central High School Class of 1893, and had initially enrolled in Michigan Agricultural College as a special student in fall 1893, receiving his BS degree in 1898. For additional information on Skeels, see Crow (2017).]

## LETTER 2

Agricultural College, Ingham Co., Michigan, October 9, 1897  
Dear Friend.

I have looked a good deal but cannot yet find any reference to *Solea*. It would not be at all surprising to find cleistogamous flowers on *Solea* as they are so frequent in *Viola*. Then you may Congratulate yourself on having made an addition to our knowledge of the behavior of *Solea*. I at once went to the garden and interviewed our *Soleas* and sure enough there were plenty of nearly ripe fruits on the tops of the stems. The early flowers are axillary.

Now I want to disabuse your mind of any lingering suspicion even, that I have not time to answer any questions you may wish to send to me. Last vacation there was so much unusual work that fell to my lot that I did neglect all my correspondents, now this is not to happen again, if I can help it.

With kind regards to M. Fallass and family.  
Yours sincerely  
C. F. Wheeler.

[Note: Subsequent to Wheeler's letter responding to her question regarding cleistogamous flowers that never open, yet produce fruits with fertile seeds, which she observed occurring late in the season on plants of *Solea concolor* (now *Hybanthus concolor*, Green Violet), Emma Cole published a nice, but short, paper on that topic (Cole 1898).