A Kind of Botanic Mania

Joan W. Goodwin

The simplicity of Linnaeus' classification system opened the field of botany to amateurs and its study was soon seen as "peculiarly adapted to females."

"I have this summer paid some attention to Botany," wrote seventeen-year-old Sarah Alden Bradford (1793–1867) to fourteen-year-old Abigail Bradford Allyn (1796–1860). "It is not a very useful study, although a very pleasing one," she continued. "It is however an innocent amusement, and enables us to discover Divine Wisdom, even in the construction of the smallest flower." Anticipating her family's move later that year of 1810 from Boston to Duxbury, where her third cousin Abigail lived, Sarah added her intention "to try to persuade you to join with me, in examining plants, and arranging them under their respective classes." 1

Apparently she succeeded. Soon Sarah's father was writing to her brother at Harvard that "Sarah & Abba are studying Botany and one would think they hold converse only with the flowers for they in a manner seclude themselves from human observation & from communication with animal nature. I dont know what flower they affect to emulate but I dare say they are known to each other under some order or class of the Lin[na]ean system." If the Harvard student should write to his sister, Bradford advised him to "talk about calyx, corolla, & petals & I will engage you will be read."²

Without realizing it, Sarah and Abba were part of a fashionable trend that was drawing many young women into the study of botany. The simplicity of the new binomial system of classification devised by Swedish botanist Carolus Linnaeus (1707–1778)—which categorized plants according to the number and position of the stamens and pistils of their flowers—opened the field of botany to amateurs, many of whom made major contributions in describing and classifying plants. Wives and daughters were introduced to the study as helpers of bota-

nist husbands and fathers. Linnaeus's daughter Elizabeth Christina saw her report on phosphorescence in nasturtiums published in the *Transactions* of the Royal Swedish Academy of Sciences in 1762.³ In this country, Jane Colden (1724–1766) was introduced to botany by her father, Cadwallader Colden, who wrote the first local flora of New York based on the Linnaean system. Jane corresponded with experts in the field on both sides of the Atlantic, was widely praised for her botanical drawings, and was commended to Linnaeus himself.⁴

From the mid-eighteenth century on into the nineteenth, the study of botany was considered especially appropriate for young women who, it was assumed, liked flowers, were nurturing by virtue of their gender, and would benefit from healthful but not strenuous outdoor exercise. As Almira Phelps wrote in her Familiar Lectures on Botany (1829), "the study of Botany seems peculiarly adapted to females; the objects of its investigation are beautiful and delicate; its pursuits, leading to exercise in the open air, are conducive to health and cheerfulness."5 However, there was some concern that since the Linnaean system was based on the sexual characteristics of plants, it might offend delicate sensibilities. In Britain, "desexualized" texts were created for female audiences, and in France Jean Jacques Rousseau omitted the Linnaean system in his 1771 Lettres élémentaires sur la botanique, written for a mother to use with her daughter. Thomas Martyn's English translation, Letters on the Elements of Botany, addressed to a lady, on the other hand, suggested that the Linnaean system be used for classification.6

Though much has been written about botany as "the female science," the letters of Sarah Alden Bradford provide a rare record of the



This portrait of Sarah Alden Bradford Ripley at fifty-three, drawn by Cheney in 1846, now hangs in the Old Manse in Concord, Massachusetts.

observations of a particular young woman caught up in the general excitement during those years. Sarah read French as well as English, and Gamaliel Bradford, her broadminded sea captain father, had even permitted her to learn Latin along with her brothers. When Sarah and Abba were not botanizing, their heads would be close together over the Aeneid, for John Allyn, Abba's father and Duxbury's minister and schoolteacher, also believed in educating daughters as well as sons. Sarah found another mentor in Judge John Davis, a Boston neighbor whose avocation was natural history. He welcomed Sarah to his library and his extensive

natural history collections. It may well have been Judge Davis who first interested her in botany. Martyn's version of Rousseau was available to Sarah in Judge Davis's library, along with Linnaeus's own Genera Plantarum (1754), Philosophia Botanica (1790), and Flora Lapponica (edited by J. E. Smith, 1792), and James Lee's popular exposition of the Linnaean system, Introduction to Botany (Edinburgh, 1797).7

Back in Boston after a happy year in Duxbury, Sarah continued her literary and botanical correspondence with Abba. From Judge Davis she borrowed The Botanic Garden (1789-1791), in which Charles Darwin's grandfather Erasmus Darwin combined mythic and scientific elements in verse. The first part, "The Economy of Vegetation," depicts the goddess Flora and numerous spirits as directing the vegetable kingdom. The second part, "The Loves of Plants," dealt with the Linnaean system in metaphors of courtship and marriage. Sarah described the first part to Abba as "very beautiful" though "highly figurative" and "splendid perhaps even to a

fault." She did not expect to like the second part so well because "[i]t is founded on the sexual system of Linnaeus, that the dust of the anthers is absorbed by the pistil, and is absolutely necessary to the production of perfect seed, which system has since been exploded, and proved to have been but a fanciful idea of that great botanist."8

She praised Linnaeus for "making the number and situation of the stamens and pistils the ground of distinction between the classes, orders, &c" and for reducing the number of classes, "which were before very numerous depending on differences in the leaves &c of

vegetables." However, she thought that "[t]he idea of sexual distinction in plants, forming so striking an analogy between the animal and vegetable kingdoms, giving so important a part in the economy of vegetation, to the dust of the anthers, which otherwise appears entirely useless to the plant, so caught the imagination of Linnaeus, that he overlooked difficulties in the way of his favorite system, which have since been proved conclusive arguments against it."9

Indeed, the Scottish professor Charles Alston, among others, disputed Linnaeus's claim that the "dust of the anthers" was essential to reproduction in plants and instead likened pollen to excrement, thrown off by the plant as superfluous. 10 Sarah would soon learn, however, that Linnaeus's system had not been "exploded." In this instance and in others that follow, it is interesting to see the scientific controversies of the time from the viewpoint of this young devotee.

In 1813, though longing to return to the woods and fields of Duxbury, Sarah was reconciled to spending the summer in Boston by her father's offer to take her to a series of botanical lectures by William Dandridge Peck. "[T]hey commence next week," she wrote excitedly to Abba, "and we are besides to have the privilege of visiting the Botanic garden as often as we please."11

Professor Peck, appointed to Harvard's newly created chair in natural history, was also director of the Botanic Garden, bounded by the present Linnaean, Garden, and Raymond Streets and augmented by a gift of land from the adjoining Andrew Craigie estate. 12 According to Peck, the garden was "intended for the cultivation of plants from various parts of the world, to facilitate the acquisition of botanical knowledge. It was also intended to receive all such indigenous trees, shrubs, and herbaceous plants, as are worthy of attention, as being useful in domestic economy, in the arts, or in medicine." Begun with contributions from nearby greenhouses, it was gradually enlarged by travelers to the East and West Indies and Africa.13

Soon Abba was treated to a secondhand version of the Peck lectures. In fact, Sarah's letters over the next few years offer a striking parallel to contemporary botanical texts written for

young people in epistolary form. The British author Priscilla Wakefield, for example, used the device of letters between two teenage sisters, Felicia and Constance, one of whom is learning botany and explaining her lessons to the other.14 Whether or not Sarah had read the American edition of Wakefield (1811), she was as eager as the young woman in the book to share her discoveries.

"I warn you before you begin you will hear nothing except de classe et ordine et genere, for there prevaileth hereabouts a kind of Botanic mania," Sarah wrote. She had obtained "our great desideratum a work almost wholly confined to Genera and species, so that if I find a flower whose name is unknown to me, I have only to turn to the page where its particular class and order (whatever they may be) are written above after the manner of a dictionary, and compare it with the descriptions of the several Genera under that class, which are so exact that it is almost impossible to mistake them, and when I find one agreeing with it exactly, I have its Generic name, I then turn to that Genus in another volume on species and find its common or trivial name as botanists say, its properties, the places where it usually grows &c."15

Sarah shared her new knowledge of willow trees ("which you know are of the class Dioecia"), giving a meticulous description of the blossoms, including "a nectarium scarcely discernable to the naked eye but very plainly seen with the help of that microscope we had last summer." She urged Abba to examine the willows in Duxbury and instructed her further about the nectarium "which varies very much in different flowers and in some makes almost their whole bulk, as in the Columbine, which you will find in the swamp at the back of your house, those four hollow tubes resembling horns are the nectaria which I know by experience for I have sucked the honey out of them many a time."16

She also learned about Cryptogamia when "Mr. Peck, our lecturer gave us a curious plant called Equisetum or horsetail, it bears its fructifications in a spike, which is composed of little plates in the form of shields supported on short foot stalks, their edges hung round with bags which when viewed with the microscope resemble the fingers of a glove, when they are ripe they burst open and drop out balls which are supposed to be the seeds, to which are affixed four strings resembling and supposed to be antherae."¹⁷

Another friend of Sarah's to receive accounts of the lectures was Mary Moody Emerson, one of whose young nephews would later become famous. "We have been attending a course of Botanical lectures, and have found them numerously frequented by the beau-monde," Sarah informed Mary, adding archly that "we are pleased to see so rational an amusement in fashion; by exciting a taste for nature it may perhaps render the country supportable to some of our fine ladies." "Linnaeus was the lady's man," she observed later, "and the ladies have just found it out." 18

For Mary, Sarah described henbane: "Its lurid and disagreeable aspect and foetid smell would repel all but the botanist. The whole plant is covered with a fine kind of glutinous hair. The colour of its blossom is a dirty yellow striped with dark purple. It is a most deadly poison, but as is generally the case with plants of its affinity has been discovered to possess great medicinal virtue." Knowing that Mary was more interested in the state of her soul than in her newly acquired knowledge, Sarah added a religious note. "Instances like these daily multiplied are unspeakably delightful," she wrote. "They vindicate the ways of God to man. What a world of wonders the vegetable creation unfolds to the enquiring eye! If the grand, magnificent, stupendous frame of some parts of the Divine scheme have oft compelled the exclamation 'what is man that thou art mindful of him' how instantly is the doubt relieved when we behold the admirable and complicated provision for the preservation, multiplication, and disperson of the most minute and to limited human knowledge apparently most useless species of vegetation!" She went on with a poetic description of the variety of seed dispersal: "those furnished with silken wings soar aloft wafted by some propitious breeze to their destined spot. Those armed with hooks avail themselves of passing travellers' aid for conveyance. Some confined in an elastic case, when ripe burst their prison, and are propelled abroad with

amazing force; others borne as it were in a light balloon cut the liquid air, or skim the surface of the wave!"¹⁹

As the lectures came to an end, Sarah was bursting with things to tell Abba. She was particularly struck with Professor Peck's account of Linnaeus's discovery of the sleep of plants. "He [Linnaeus] was presented with some unknown plants in blossom, and not having time to examine them, he ordered the gardener to set them out, and take particular care of the blossom. At evening being at leisure he visited them and to his chagrin and disappointment the flowers were not to be found. The gardener was reprimanded and promised to be more careful in future. The next morning they were visible and Linnaeus engaged again deferred visiting them till evening when the flowers had disappeared as before. This was done thrice, and at length examining them more closely, he found the floral leaves at the base of the blossoms had risen and completely enveloped them. Struck with the idea that some such change might take place in all plants, at midnight with a lantern he visits his greenhouse, and there sure enough he finds his dear family all sound [asleep]. The solemn hour of night combined with the silence and novelty of the scene affected Linnaeus even to tears. They were the tears of admiration and gratitude we may suppose a parent might shed at the development of some new faculty in a beloved offspring." As a demonstration to his class, "Mr Peck brought a plant asleep one morning, which was very carefully wrapped up in cotton wool to keep it from the light; the leaves were curiously folded together, but by exposing it to the influence of the sun's rays, before lecture was over it had begun to recover."20

When Professor Peck lectured on Linnaeus's experiment with the fig tree, Sarah was convinced, if she had not been before, of the sexual function of flowers. She described for Abba "an exhibition with the solar microscope of the flowers of the fig tree which grow within the fruit, and are curious also as being an example of the 23 class. The fig was quoted and termed fructussine flore in contradiction to an assertion of Linnaeus that flowers were absolutely necessary to the production of fruit. [However,

Linnaeus discovered the hiding place of the blossoms and taught his opponents that in many cases, in order to form an accurate judgment it is necessary to look beyond the surface."21

The following summer found Sarah still enthusiastic about botany. She encouraged Abba to visit her, writing, "Craigie's swamp will be full of flowers, Smith's botany will be published, and we will enjoy ourselves finely together."22 In 1814, Jacob Bigelow, founder and president of Boston's Linnean Society, brought out the American edition of James Edward Smith's popular English botany text, trusting that "the present edition will not be unacceptable to the public, particularly to students attending the botanical lectures in this place, for whose use it was originally undertaken."23 He added notes on American plants and an expanded glossary of botanical terms. In Smith Sarah could read the full account of the "luminous experiment" in which Linnaeus removed the anthers from a flower, destroying the rest of the day's blossoms, and another day repeating the process but sprinkling pollen from another flower on the stigma of one from which he had removed the anthers. When the first flower produced no fruit while the second produced perfect seed,

Linnaeus had proved his point, according to Smith.24

In Smith's eyes, the facts of plant life did not detract from the delight of botanical study. "The natural history of animals, in many respects even more interesting to man as an animated being, and more striking in some of the phenomena which it displays, is in other points less pleasing to a tender and delicate mind," he wrote in his preface, while "[i]n botany all is elegance and delight. No painful, disgusting, unhealthy experiments or inquiries are to be



William Dandridge Peck, professor of natural history and founding director of the Harvard Botanic Garden in Cambridge (1805–1822), credited his interest in natural history to an "imperfect" copy of Linnaeus's Systema Naturae that he retrieved from a ship wrecked near his home in Newbury, Massachusetts. Almost immediately on being named director of the vet-to-be-created Harvard Botanic Garden in 1805, William Peck set sail for Europe, where for three years he visited the great gardens, collecting seeds, plants, books, and ideas.

made. Its pleasures spring up under our feet, and, as we pursue them, reward us with health and serene satisfaction. . . . The more we study the works of the Creator, the more wisdom, beauty and harmony become manifest, even to our limited apprehensions; and while we admire, it is impossible not to adore."25

As we have seen, Sarah, with her Unitarian upbringing, had already found botany to be a religiously illuminating experience. "If you have never examined a dandelion flower," she wrote Abba, "you will find it very curious, the

A Plan for the Botanic Garden at Cambridge

The idea for "a large well-sheltered garden and orchard for students addicted to planting" was broached at Harvard as early as 1672, and in 1784 the King of France offered "to furnish such [botanic] garden with every species of seeds and plants which may be requested from his royal garden, at his own expense." Finally, in 1805, a collaboration between the College and the Massachusetts Society for Promoting Agriculture provided for a professorship of natural history; among the duties of the professor was the formation of a "Botanic Garden on the grounds that shall be provided for that purpose." * William Dandridge

Peck promptly set sail for a lengthy tour of

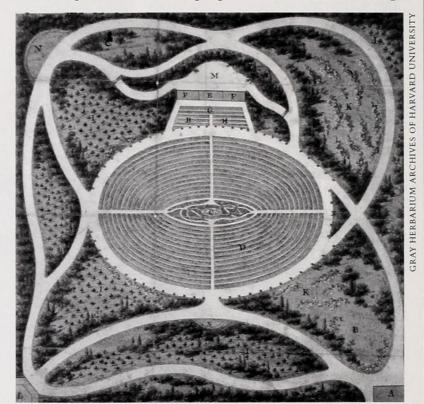
western Europe.

At Uppsala Peck acquired seeds of 150 species of plants and 500 herbarium specimens that "are such as are rare and valuable, especially as they are from persons of the most correct information." He was told there "that the arrangement of plants in a garden according to Classes and orders in the [Linnaean] System is both difficult and inconvenient; but the disposition of them according to their natural orders in concentric circles is much more commodious."

In 1808 he sent a plan (top right) from Paris that grew out of several conversations at the Jardin des Plantes with M. Thouin, "a gentleman of eminence in the profession of ornamental gardening." It provided for various trees and flowering shrubs; small lawns with flowers and shrubs; hothouse, greenhouses, cold frames, and hotbeds. The "garden of Arrangement or Botanic School" forms the large central oval (D). From Kew Peck had written, "A reservoir of water fed and kept sweet by a small spring is the best situation for aquatic plants." Accordingly, "Bason or reserves with running and stagnant waters" are designated at center (C).

Peck had seen the Garden's site only briefly before his European trip, and although he remembered the wetland, he did not recall the shape of the grounds. In the 1888 plan (bottom right) some of the elements of the 1808 scheme can be seen, including a pool for aquatic plants at the center of the concentric planting beds. Native and exotic trees and shrubs were planted at once, and later came a conservatory; native herbs around a spring in the southwest corner; seedplots, cold frames, and hotbeds screened by a hedge of European beech; a gardener's cottage.

* Goodale, George L. 1991. The Botanic Garden at Cambridge. Harvard Register, Vol. 3 (Jan.).





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downy wings of the seeds by which they are scattered far and wide. The perfect uniformity of the little flowers, each with its pistil and five stamens united by the anthers, the filaments separate, almost too small to be distinguished with the naked eye. The same order, regularity and beauty are as visible in the least as in the greatest of the works of creation. Do you think a dandelion could have been the work of chance? Surely that study cannot be entirely useless which can make even this most despised of flowers a source of admiration and entertainment, a demonstration of the hand of a Creator."26

Two years after the lecture series, Sarah wondered if Abba was reading Smith and recommended the sixteenth chapter on the functions of leaves. "It is amusing," she wrote, "to trace the striking analogies between the animal and vegetable kingdoms in respiration, secretion & all the similar and diversified effects of the vital principle in each. Theories which pretend to explain these effects in vegetation on chemical or mechanical principles are unsatisfactory." Smith had mentioned heat and wind as possible causes for the flow of sap from root to branch.²⁷ It seemed to Sarah that "[t]he attraction of cohesion may account for the ascent of fluids to small heights, but not for the propulsion of the sap from the spreading roots of the oak throughout the unnumbered ramifications of its towering limbs; that this most important function should depend on the agitation of the inconstant breeze is equally inconceivable; if you ascribe it to the vital energy and suppose some action of the spiral coated sap vessells similar to the pulsation of the arteries, a distinction sufficiently broad is marked between organic and inorganic bodies, and the operations of animal and vegetable organs analogous in their curious structure and combinations, are explained from similar causes. How regular the gradation too from species to species in the long series of organized existance!"28

Continuing her line of thought, she confronted Abba with a botanical extension of the popular philosophical idea of the Great Chain of Being supposed to link deity and the hierarchy of heavenly spirits with humans and the lower animals. "I suppose your ladyship would not

feel her dignity much impaired by kindred with the majestic elm or delicate sensitive plant," she wrote, "but how would you receive the hand of fraternity extended by a potato or toadstool? Distinctions which appear so striking and marked when extremes are compared blend insensibly into each other as we descend, and genus is linked with genus in a chain which the delighted philosopher cannot nor does not wish to dissolve. Nature never disturbs us with abrupt transitions in any of her operations; broad day softens into twilight, twilight deepens into the shades of evening; the process of vegetation, from the first swelling of the seed till the perfect plant appears in all the luxuriancy of foliage and beauty of fructification, is so imperceptible that we are affected with no wonder or admiration at the secret agency of Divine power in the successive stages of its progress and are astonished only when we compare what it is with what it was."29

Sarah continued botanical study throughout her life. Three years after she wrote the letter just quoted, she married the Rev. Samuel Ripley, the Unitarian minister in Waltham who also kept a boarding school to prepare boys for Harvard. In addition to teaching Latin, Greek, and mathematics in the school, Sarah raised her own seven children and an adopted niece and managed the large household with only sporadic help. Collecting excursions to Prospect Hill and visits from an expert amateur botanist, the Rev. John Russell, provided much-needed recreation during those busy years.

When Asa Gray was appointed Fisher Professor of Natural History at Harvard in 1842, he was told about "a learned lady in these parts, who assists her husband in his school, and who hears the boys' recitations in Greek and geometry at the ironing-board, while she is smoothing their shirts and jackets! . . . reads German authors while she is stirring her pudding, and has a Hebrew book before her, when knitting. . . . Even my own occupation may soon be gone; for I am told that Mrs. Ripley (the learned lady aforesaid) is the best botanist in the country round."30

Soon Gray was sharing his books with this learned lady. One, "a beautiful edition of a

french work on botany," gave Sarah "great pleasure in getting at the mind of a man of genius through his scientific method." She found it "much more satisfactory to begin from the root and study upwards, than to pick open a flower, count the stamens refer it to a class and give it a name."31 When a book on European mosses came to the botanical library, Gray promised to loan it to her as soon as he had finished with it himself.32

Sarah spent her last years in retirement at the Old Manse in Concord, Massachusetts, where some of her mounted specimens may be seen. In her seventies, she was still teaching botany, writing to a young grandson, "I long to have the bright days of summer come for you and dear little Ezra to gather flowers of all kinds. . . . And poor old GrandMa will tell him all she knows, and put them in a book that has pretty flowers, which have been pressed and kept a great while, and are still bright and beautiful."33

Endnotes

- 1 SAB to ABA, n.d. (1810?), Sarah Alden Bradford Ripley Papers, MC 180, Schlesinger Library, Radcliffe College, hereafter cited as SABR.
- ² Gamaliel Bradford to Gamaliel Bradford, Jr., "Thursday" (1810?), Bradford Papers, bMS Am 1183.32, by permission of the Houghton Library, Harvard University.
- ³ Ann B. Shteir, "Linnaeus's Daughters: Women and British Botany," in Barbara J. Harris and Jo Ann K. McNamara, eds., Women and the Structure of Society (Durham, NC: Duke University Press, 1984),
- ⁴ See Mary Harrison, "Jane Colden: Colonial American Botanist," Arnoldia (Summer, 1995) 55(2): 19-26.
- ⁵ Quoted in Vera Norwood, Made From This Earth: American Women and Nature (Chapel Hill: University of North Carolina Press, 1993).
- ⁶ Ann B. Shteir, Cultivating Women, Cultivating Science: Flora's Daughters and Botany in England, 1760-1860 (Baltimore: Johns Hopkins University Press, 1996), 19-20, 23.
- ⁷ Catalogue of the Private Library of the Late Judge Davis (Boston: Alfred Mudge, 1847), 17, 20, 43.
- ⁸ SAB to ABA, Nov. 3 (1812?), SABR.
- 9 Ibid.
- 10 Shteir, Cultivating Women, Cultivating Science, 17. James Edward Smith, An Introduction to Physiological and Systematical Botany, First American, from the Second English Edition, with

- notes by Jacob Bigelow, M.D. (Boston: Bradford & Read, 1814), 253. Smith names Tournefort and Pontedera as being of the same opinion.
- 11 SAB to ABA, n.d. (1813), SABR.
- 12 Jeannette E. Graustein, Harvard's Only Massachusetts Professor of Natural History, Harvard Alumni Bulletin (December 13, 1958), 243.
- 13 William Dandridge Peck, A Catalogue of American and Foreign Plants Cultivated in the Botanic Garden, Cambridge, Massachusetts (Cambridge: University Press, 1818).
- 14 Priscilla Wakefield, An Introduction to Botany, in a Series of Familiar Letters (1st British ed., 1796; 6th ed., Philadelphia: Kimber & Conrad, 1811).
- 15 SAB to ABA, n.d. (1813), SABR. Sarah offers no authors or titles for the books she was using prior to the publication of the American edition of Smith.
- 16 Ibid.
- 17 Ibid.
- ¹⁸ SAB to MME, n.d. (1813); Sept. 5 (1817?), SABR.
- 19 SAB to MME, n.d. (1813), SABR.
- ²⁰ SAB to ABA, n.d. (1813), SABR.
- 21 Ibid.
- ²² SAB to ABA, n.d. (1814), SABR.
- ²³ Jacob Bigelow, "Advertisement to the American Edition," Smith, v.
- ²⁴ Smith, 253.
- 25 Ibid., 18-20.
- ²⁶ SAB to ABA, n.d. (1812?), SABR.
- ²⁷ Smith, 54-55.
- ²⁸ SAB to ABA, Sept. 30 (1815), SABR.
- 29 Ibid.
- 30 Jane Loring Gray, ed., Letters of Asa Gray (Boston: Houghton, Mifflin, 1893), I: 289.
- ³¹ SAR to George F. Simmons, June 26, 1844, SABR. Unfortunately, Sarah failed to mention the name of this "man of genius" or the title of his book.
- 32 Ibid., Dec. 12, 1844.
- 33 SAR to William Sydney Thayer, n.d. (winter, spring, 1867?), MS Storage 296 (#51), by permission of the Houghton Library, Harvard University.

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Joan W. Goodwin, who lives in Brookline, Massachusetts, is an independent scholar now completing a biography of Sarah Alden Bradford Ripley.



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