The Brandegees: Leading Botanists in San Diego

Nancy Carol Carter

The most renowned botanical couple of nineteenth-century America lived in San Diego from 1894 until 1906. They were early settlers in Bankers Hill, initially constructing a brick herbarium to house the world's best private collection of plant specimens from the western United States and Mexico. They lived in a tent until their treasured plant collection was properly protected, then built a house connected to the herbarium. Around their home they established San Diego's first botanical garden: a collection of rare and exotic plants that impressed both amateur and professional gardeners. Botanists and plant experts from around the world knew of this garden and traveled to San Diego to study its plants. Irving Gill later modified the site to serve as The Bishop's School day campus. Today the property is home to the Self Realization Center of San Diego.

Brandegee herbarium ca. 1894. Photo courtesy The University & Jepson Herbaria, University of California, Berkeley.

Katharine Brandegee (1844-1920) and Townshend Stith Brandegee (1843-1925) are credited with important and lasting contributions to North American science. Among other accomplishments, they furthered the maturation of the Pacific coast scientific community. Katharine Brandegee especially was prominent as a systematic botanist who pushed back against the assumed superiority of the East Coast scientists, personified in Asa Gray, Professor of Botany at Harvard University from 1842 until 1873 and founder of the Harvard Botanic Garden and Harvard Herbarium.[1] Although they held Gray in high esteem and generally agreed with his scientific principles, the Brandegees eventually claimed a superior ability to classify and appropriately name the plants they had collected and observed. Aware of delays and impatient with the imprecision of more distant

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classification work, they resisted the tradition of submitting new species to Gray or other East Coast scientists for botanical description.[2] They became expert taxonomists who described and defended their science in West Coast journals. During their lifetimes, the Brandegees published a combined total of 159 scientific papers.[3] Their example inspired other Pacific Coast botanists to greater confidence in their own field experience and the value of botanically describing plants within the context of the unique and geographically contiguous plant life of the west.[4]

Separate Lives: Mary Katharine Layne Curran

Mary Katharine Layne's early years provided no hint of future eminence in American science, according to one biography.[5] The second of ten children, she was born in Tennessee. Her early childhood was unsettled as the family gradually migrated westward. Her parents resisted Brigham Young's Mormon proselytizing during a brief residence in Salt Lake City, and eventually reached California. Mary Katharine's restless father, Marshall Bolling Layne, settled his family on a farm near Folsom, a gold rush town north east of Sacramento. He taught school and had worked as a miller, but was not a good provider for his ever-growing family. He was called "high tempered" and difficult, but his oldest daughter later recalled him as "an impractical genius."[6]

Although Mary Katharine—known as Katharine or Kate—received a spotty early education, she became a teacher. She complained to her sister that she earned barely enough to feed herself.[7] In 1866, when twenty-two years old, she wed the local constable, Irish-born Hugh Curran. Eight years later she was a widow. Little is known about this first marriage, but it was said to be troubled and difficult due to the alcoholism that caused Curran's death.[8]

The loss of her husband was a significant juncture in Katherine Curran's life. One year later, the young widow moved to San Francisco and entered medical school. The formerly private Toland Medical College had been deeded to the University of California Regents in 1873 to become the Medical Department of the University. In September 1874, the regents adopted a resolution stating that, "young women offering themselves for admission and passing the required examination must be received to all the privileges of the Medical Department."[9]

There is no account describing Katharine Curran's experience as a medical student, but the difficulties and inhospitable treatment meted out to the woman pioneers in professional schools are well documented. One University of California medical student of the time described her "reluctant admission, the Dean's incitement of male students to harass her, and the advice of one instructor to have her ovaries removed if she wanted to continue in medical school."[10] Regardless of whether she was subject to similar pressures, Katharine Curran earned an M.D. degree in 1878.

During medical school, Katharine Curran found that the required pharmacological classes fed her long-term interest in natural history. In the nineteenth century, natural plant materials were the source of most medicines, so the study of medicinal substances, the *materia medica*, included a heavy dose of botany. Her instructor was Hans Herman Behr from the university's Department of Pharmacology.[11]

Dr. Behr was the product of a classical German education and had lived in

Mary Katharine Layne Curran Brandegee. Photo courtesy The University & Jepson Herbaria, University of California, Berkeley.

Australia, Asia, and South America before settling in San Francisco in 1851 to practice medicine. He became associated with the University of California and was drawn by his interest in the natural sciences to the California Academy of Sciences (originally the California Academy of Natural Sciences).[12] He joined the Academy in 1854, injecting a valuable level of scientific training, linguistic skill, and world experience into the newly formed learned society. While easily one of the most rigorously trained scientists associated with the Academy, his kindly nature and generosity in sharing knowledge won him friends and acolytes.[13] He warmed to the interest, intelligence, and diligence of Katherine Curran and trained her in the botanical work that would fill her life for the next fifty years.

While still a medical student, Katharine was introduced to activities at the California Academy of Sciences. She was interested in birds and insects, but Dr. Behr steered her to the herbarium—a collection of dried specimen plants used as the basic reference source for those who describe, name, and classify plants. The more examples of plants, the better, but plant taxonomists can do their work only if herbarium specimens are properly organized. The Academy was minimally staffed and the collection's value was diminished by a backlog of unclassified plant material. When Katharine found she had time on her hands due to the difficulty of establishing a medical practice in San Francisco, she kept busy at the Academy of Sciences, working with Albert Kellogg, a founder of the Academy and curator of the herbarium.[14] She devoted more time to field work, having made her first botanical collecting trips with other medical students in Dr. Behr's classes.[15] She enjoyed the outings and learned that observing plants as they grow in nature and recording characteristics not evident in a dried specimen can lead to better taxonomy and more reliable science.

The Academy was very open to the participation of women, having adopted a resolution at its 1853 founding approving "the aid of females in every department of natural history" and "earnestly inviting their cooperation."[16] Katharine Curran officially joined the Academy in 1879 and, when Kellogg retired in 1883, she was appointed to the Curatorship of Botany. If there was resistance to placing a woman in this important position, it melted in the face of strong support from her distinguished mentors, Drs. Behr and Kellogg. Although many nineteenth-century women were interested in botany, few found gainful employment in the field.[17] Upon assuming her position, Katharine became the second woman in the entire country to be employed professionally in botany.[18]

Despite her prior volunteer work, she described the herbarium as being "in a shocking condition" and once in charge turned her considerable energy to its improvement.[19] She also worried that the reputation and impact of the Academy were in decline due to a decade-long stagnation of the publications program. The work of the Academy was unsung and California botanical species were not being scientifically published, unless sent out to other institutions.

Curran established and singlehandedly produced the *Bulletin of the California Academy of Sciences*, taking up the scholarly writing and editorial work that she continued for the rest of her life. Called the "acting editor" because the Academy could not admit to giving a woman editorial control of its scientific journal, she created a "credible West Coast vehicle for the naming of new species, a process that had previously been routed through the Eastern hegemony of Asa Gray at Harvard."[20] A revived Academy publication program gave western botanists a means of publishing their findings more quickly and aided the cause of scientific independence. This desire for liberation was motivated by different schools of thought. Some wanted to escape the influence of Darwinian thinking that had gained acceptance at most East Coast scientific institutions. Others, especially the active field collectors like herself, held many eastern classifications of California flora in contempt and simply wanted better science.[21]

At the Academy, Katharine had won the respect of powerful men, moved into a top position, and demonstrated initiative and leadership. She became a commanding force and immersed herself in Academy affairs, thereby defying the pattern described by one historian in which early women scientists avoided institutional

Katharine Brandegee on a mule in Baja California. Photo courtesy The University & Jepson Herbaria, University of California, Berkeley.

involvements that might get them labeled as troublemakers. This research finds women shying away from competitive activities that celebrate individual achievement, such as research and writing. Instead, women scientists in institutional settings are said to have "kept a relatively low profile" while focusing on outreach and networking.[22] Katharine, however, was unafraid of taking risks and did not fear competitive involvement.

When a large financial bequest sowed division in the Academy, Curran jumped into the bitter power struggle as a matter of principle. She supported a "reform ticket" that championed science over personal aggrandizement (whatever that may have meant in the context of the one-million-dollar gift). Her faction voted out the long-term president and replaced the governing board of the Academy.[23] Presumably she could have lost her job if the election had turned out differently. The toughness that underlay her unlikely rise in the world of science was openly revealed for the first of many times. Critics did not fail to notice.[24]

As Katharine Layne Curran passed her fortieth birthday, her life seemed at last settled after the unanticipated twists and turns of a childless marriage, an early widowhood, and a medical career that never prospered. She held an important position at the premier scientific institution in the western United States, won through talent, exertion, and daring unconventionality.[25] She pursued a satisfying routine of herbarium work, scientific writing, production of the Academy *Bulletin* and botanical study and field collecting. Then Townshend Stith

Brandegee made his first visit to California. Katharine's life was about to take another unexpected turn.

Separate Lives: Townshend Stith Brandegee

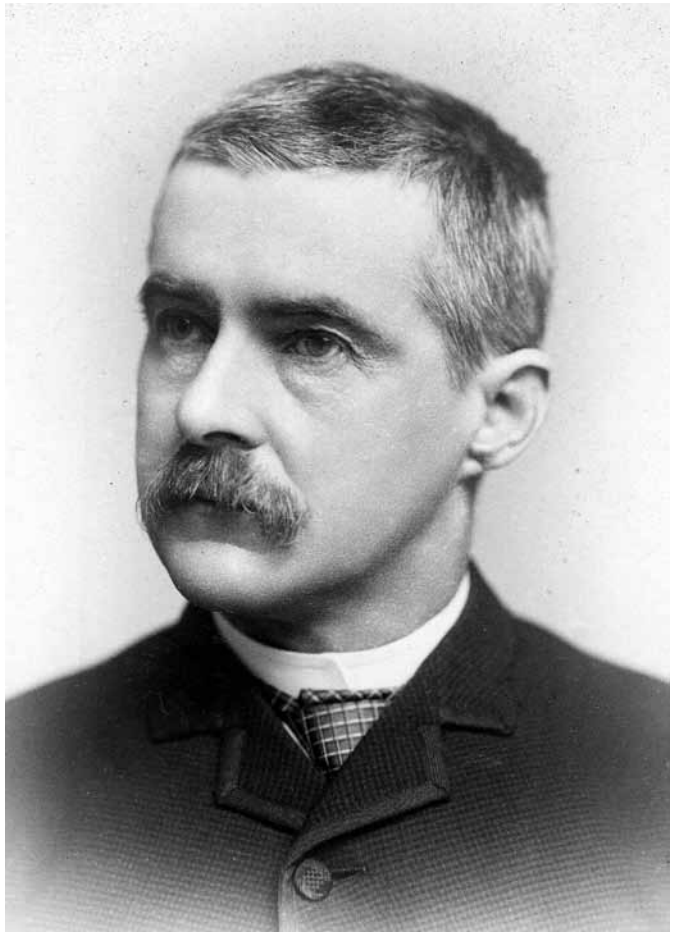
A candid assessment of T. S. Brandegee is found in the diaries of Richard Urquhart Goode, written during the 1883 Northern Transcontinental Survey. Brandegee was thirty-five years old and already a seasoned member of survey expeditions. While initially employed as a civil engineer, his long-term amateur interest in botany and well-received botanical publications had by 1883 gained him an appointment as botanist of this party. Goode wrote:

> He is very quiet and reserved, not at all nervous or emotional, a little selfish, but always willing to adapt himself to his surroundings. You could not under any circumstances induce him to quarrel with you, but he always has his own opinions, which if they fail to chime in with the surroundings he keeps to himself and does not make a fuss when nothing is gained thereby. His appearance is by no means prepossessing but he has an open, honest face, is of medium height, and can stand a good deal of hard climbing and exposure, but avoids such on all occasions when it is not his duty to undergo them. He is rather careless in his dress and could under no circumstances be called a "dude."[26]

Many other descriptions refer to Brandegee as mild mannered and reserved, although Goode's unexplained charge of selfishness is never repeated. Rather, Brandegee is usually called kindly, refined, and generous. In later life, his wife wrote to someone about to meet Brandegee for the first time, "I know you will like him, everyone does."[27] He also may be credited with a sardonic sense of humor as he once summarized his Civil War service with the line: "General Grant and I took Richmond."[28]

Brandegee was born February 16, 1843, in Berlin, Connecticut. His father was a doctor and a farmer with an interest in natural history. The young Townshend also studied the natural world and created his own collection of ferns while attended local schools. He did hard farm labor, including plowing with oxen. He enlisted in the Union Army at age nineteen and served two years.[29] After the Civil War he studied engineering and botany at Yale University's Sheffield Scientific School. During these college years, he botanized in the New Haven area, making significant finds of rare plants for the Connecticut botanical record.

One year after graduation, in 1871, Brandegee accepted a job as county surveyor and city engineer in Colorado. He continued to collect plants, sending ferns and other specimens back to Connecticut. Harvard botanist Asa Gray benefited from some of Brandegee's finds. His recommendation resulted in Brandegee's appointment as assistant topographer on the Hayden Survey.[30] Thus began many years of surveying and botanical work across the West, from Santa Fe to Wyoming to Washington. Brandegee prepared forest maps of various western regions, combining his engineering training and expanding knowledge of western plant life. He collected samples of western timber for the American Museum of Natural History.[31] This work brought him to California in the winter of 1886-87. When seeking



Townshend Stith Brandegee. Portrait. Photo courtesy The University & Jepson Herbaria, University of California, Berkeley.

specific rare trees on Santa Cruz Island off Santa Barbara, the unusual flora so peaked his interest that his career reached a turning point. Brandegee decided to move away from civil engineering and toward full-time work in botany.[32]

The California Academy of Sciences in San Francisco was on the West Coast itinerary of every nineteenth-century natural history enthusiast. Townshend Brandegee visited the Academy during this first California trip, making his way to the herbarium where he met Katharine Layne Curran, the knowledgeable curator of the collection. Curran, who had not traveled widely after her family settled in California, was most likely fascinated by the vast field experience in botanical collecting afforded Brandegee during his years of survey work. As the builder of a herbarium collection and an editor, she may have welcomed him as a source of interesting new botanical specimens and a potential author for the Academy *Bulletin*. These two natural history and botany enthusiasts shared common intellectual ground. Both were in their early forties, accomplished in their fields, and respected within the circles that knew their work. Yet, when they met, the most significant scientific endeavors of Katharine Lane Curran and Townshend Stith Brandegee lay ahead. They would accomplish this work as husband and wife.

A Marriage of Hearts and Minds

Very little is known about the courtship of Curran and Brandegee, but we do know that theirs was not merely a match of convenience. Their meeting sparked passion and romance, obvious enough to be considered by some contemporaries as unseemly for persons of their age. There is no better indication of the nature of this relationship than Katharine's own words: the joyful confession of being "insanely

Brandegees together on a bench. Photo courtesy The University & Jepson Herbaria, University of California, Berkeley.

in love."[33]

No similarly revealing personal declarations from Brandegee have come to light, but perhaps his decision to marry involved a combination of factors. Just as he was deciding to make botany his life work, he met an intelligent woman capable of sharing his interest and nurturing his development in the science. From Katharine he could learn more about the systematic arrangement of botanical collections and the exacting work of taxonomy. She could also be counted on as a companion in field work, having already proven herself as a collector. After years of bachelorhood, Brandegee's decision to marry may also have been influenced by a timely inheritance. He received a legacy shortly after arriving in San Francisco that ensured his financial independence and ability to establish a home and support a wife.[34]

The couple made their plans and Katharine traveled to San Diego in 1889 to meet Brandegee's ship that was returning from a California Academy of Sciences collecting trip on the Baja California peninsula. The *West American Scientist* reported: "Mr. T.S. Brandegee and Mrs. Mary K. Curran, both of San Francisco, surprised their friends by a quiet wedding on May 29 [1889]. They were married in San Diego by Rev. Dr. Noble. The *Scientist* offers them its heartiest congratulations." The newlyweds enjoyed a honeymoon devoted to plant collecting, accomplished as they walked all the way from San Diego to San Francisco in the weeks after their wedding.[35]

The Brandegees established a home in San Francisco and retained their ties to the California Academy of Sciences. T.S. became a resident member of the Academy and joined its scientific expeditions. The bride experimented with the form of her name, eventually settling on Katharine Layne Brandegee. She remained busy at the Academy's herbarium and founded a new private scientific journal called *Zoe* in 1890. Its cost was underwritten by T.S.'s inheritance and it carried his name to lend respectability. It was assumed that editorial control by a female would weaken credibility in the science world.[36]

In 1891 Katharine founded the California Botanical Club, the West Coast's first general interest and amateur organization of a kind popular in the east.[37] Meanwhile, she continued her botanical collecting trips, sometimes with her husband, but often on her own.[38] Marriage did not cramp the field work of either spouse and they were not discouraged by the occasional shipwreck or broken bone.[39] Katharine made extensive journeys into the Sierra by stage, on foot, and using the free railroad passes available to botanists after the completion of the transcontinental railroad in 1869. She wrote to her husband, "Tomorrow I leave on the stage for the Giant Forest where I will be for nearly a week. Then I try to get higher with a packer guide and finally fetch up across country to Mineral King. It may be 3 or 4

weeks before I reach there." In other letters she wrote to her husband, "I am going this morning to be camped alone at an altitude of 10,000 feet on Mt. Silliman" and "there are numerous bears in these mountains, many mountain lions, and an occasional gray wolf." [40]

A year after their marriage, the Brandegees met Alice Eastwood, a young Colorado school teacher and amateur botanist. Eastwood sought out T.S. Brandegee while on a California plant-hunting excursion. She knew his work on the Hayden Survey in Colorado and from the masthead of *Zoe*. Alice Eastwood wanted to become a botanical writer.[41] The Brandegees were drawn to Eastwood's enthusiasm and seriousness of purpose. A few months later, they visited her in Denver and were impressed by the botanical acumen and technical skill evinced in her small herbarium. Eastwood spent part of the next year at the Academy of Sciences, sharing Katharine's salary, then came to work full-time in San Francisco.[42] She worked in the herbarium, wrote for the *Bulletin,* and later edited *Zoe*.[43] Academy records detail Katharine Brandegee's request made on December 5, 1892, that her full salary of $80 per month be paid to Alice Eastwood. The former would continue to serve as joint curator and "render such services as she could" without a salary. The Board of Trustees adopted a resolution stating that "the zeal and efficiency evinced by Mrs. Brandegee during the years of her labors in the herbarium had been such to merit our highest commendation."[44] While creating more time for her own scientific work, Katherine Brandegee had launched the career of Alice Eastwood who through both aptitude and longevity became one of America's best-known botanists.[45]

Once Alice Eastwood was on board at the Academy, Katharine Brandegee plowed deeper into her own interests and areas of strength, especially plant taxonomy: the finding, describing, identification, classification, and naming of plants. Through her rigorous training and substantial experience, she had developed strong ideas about the scientifically sound approach to this science. She disdained the egocentric drive of some botanists to publish new species just to get credit for a plant discovery. She was appalled when "new species" were published with inadequate or sloppy descriptive work, knowing that fuller research might show that the plant was simply a variation of an existing species. She was scornful of the pre-Darwin notion that a creator had set every living thing on earth in a fixed and final form, thereby foreclosing the possibility that a single species might develop variations due to climate and soil. Finally, in the never-ending taxonomy battle, she sided with the "lumpers" rather than the "splitters"; that is, she was more likely to see relationships among plants and classify broadly. She spent a certain amount of her field work seeking out intermediates that would dispose of proposed new species.[46] As a lumper, she tried to rein in the splitters by setting a high bar for the proclamation of a new species, but did not convince everyone. She once lamented that "Mr. Brandegee [has described a plant as a species] against my will."[47]

Katharine Brandegee with Guinea hen. Photo courtesy The University & Jepson Herbaria, University of California, Berkeley.

The Brandegee's new journal, *Zoe*, was founded to further the independence of West Coast natural science and to speed up the publication of California botanical

finds. The established *Botanical Gazette* generously reviewed its first issue. *Zoe* was a forum for Katharine's brand of rigorous botanical science.[48] Whatever constraint she had felt when writing in the *Bulletin* of the Academy of Sciences was now removed. The publication was her bully pulpit, used to encourage more exacting science and higher standards in the increasingly professionalized field of botany. She mercilessly dissected substandard botanical descriptions. She wrote ferocious criticisms and point-by-point refutations of bad science, as she perceived it. Her most brutal assault was on the work of Edward Lee Greene. He came to the San Francisco Bay Area as an Episcopal priest, but was a keen amateur botanist and worked with Katharine for a while in the Academy herbarium. By most accounts, he was ambitious, egotistical, and self-aggrandizing. He was also a rising star who won an appointment to teach botany at the University of California in 1885.[49]

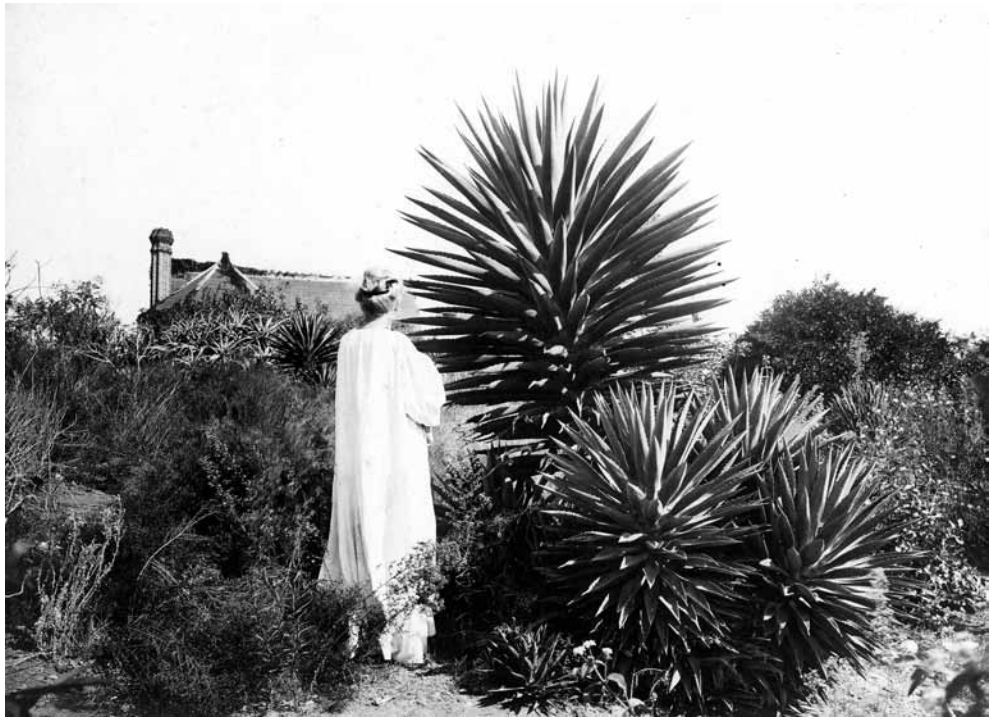
Greene was an outspoken critic of Darwin and a splitter who seemed to find a new species growing beside every rock. Katharine savaged his approach, saying, "This kind of botany was taught, probably, in the Middle Ages to which Mr. Greene properly belongs."[50] She condemned his lack of insight, accuracy, and judgment and said that his vague descriptions of so-called new species were "a disgrace to botany." Greene did not defend his work in print, but referred to Katharine Brandegee as a "she devil."[51]

The high profile sword crossing of Greene and Katharine Brandegee was an intellectual conflict in which each contender had backers. Katharine won admiration for the power of her intellect and defense of high standards, but condemnation for her unladylike boldness and the personal nature of her attacks on Greene. The best explanation for her antipathy resides in Greene's own acts of bad faith. In a clumsy effort to impress Harvard's Asa Gray, Greene egotistically bragged to Gray that he was the botany curator at the Academy, with Katharine Brandegee as his assistant. After her hard-won achievement at the Academy, Greene's self-serving lie—peddled to the leading botanist in America—must have been galling indeed. Moreover, when Greene was forced out of his Episcopal pastorate on moral grounds, he plotted unsuccessfully to push her out of the Academy and take over her position.[52]

Katharine's critiques published in *Zoe* secured her permanent place in the history of botany. According to one author, "The unvarnished criticism of what she viewed as botanical incompetence illustrate the intensity of the woman who brought much needed order and respectability to California botany."[53] Another writes, "Her mind was keen and her search into detail exhaustive."[54] A plant scientist observes simply: "She was the greatest woman botanist that ever lived."[55]

The Lure of Desert Plants

Neither of the Brandegees was again required to take up salaried work, but they pursued their science tirelessly. Once T.S. Brandegee turned to botany as a prime occupation, he specialized in the flora of Mexico and the Southwest. He joined an 1889 Academy of Sciences expedition to Magdalena Bay, Baja California, at his own expense. On this first of a series of major collecting trips to Mexico, Brandegee traveled some 600 miles by mule, and became the first plant collector to visit many parts of the Baja California interior. A scientific journal reported: "Messrs. T.S. Brandegee and Walter Bryant returned in May from an extensive trip through Lower California…Mr. Brandegee reported the collection of about thirty species of



Katharine Brandegee in her San Diego garden. Photo courtesy The University & Jepson Herbaria, University of California, Berkeley.

cacti; and altogether nearly a thousand species of plants, while his field notes will give the most southerly stations for many of the California plants."[56]

In April and May 1893 Brandegee traveled with five other naturalists to the Sierra San Pedro Mártir of northern Baja California and became the first botanist to explore the range.[57] Later that year, in September and October, he made two trips from San José del Cabo into the mountains of the Cape region. Katharine joined him on the first trip, along with another scientist from the Academy. The *San Francisco Chronicle* reported on the venture, but missed the botanical aspect of the trip in its headline: "Off on an Odd Expedition: Two Men and a Woman Chasing after Snakes and Bugs." Mrs. Brandegee reportedly, "rode astride of her mule, man fashion in the pantalooned suit that she took with her for the purpose. Her strong leather leggings were found to be a wise precaution for passing through the thorny cactus regions, the narrow defiles of the mountains or the washed out canyon trails."[58] Returning home on her own from this trip, Katharine was shipwrecked. Accounts of this incident report that T.S., upon hearing of the accident, first inquired about the fate of the plant specimens she was transporting.[59]

Over the five-year span of his Mexico expeditions, T.S. Brandegee established himself as the leading authority on the flora of Baja California and the islands of the Sea of Cortez.[60] He gained confidence as a botanist and, instead of sending his plants to other experts for botanical description, began to publish his own species. All told, he discovered and named some 225 plants of Baja California. Many others were later named from his collections.[61]

To pursue this intense interest in the flora of Mexico more conveniently, the

Brandegees decided to abandon their well-established San Francisco life and move to San Diego. Considering distances, travel times, and the hazards of safely returning plant specimens to a clean and dry workroom, greater proximity to collection sites was advantageous. The Brandegees had used San Diego for embarkation to Baja California and it had been the scene of their wedding. Moreover, Katharine's sister had settled in Ramona.[62] One author suggests that Katharine also might have been ready to distance herself from Academy politics and to "practice her incipient leanings toward experimental systematics" in a year-round garden.[63]

The journal *Zoe* showed a change of address to San Diego in its January 1894 issue and a March 1894 letter indicates that the Brandegees were in San Diego by that date.[64] The next month, a deed was registered for T.S. Brandegee's purchase of Block 350 of Horton's Addition in San Diego. For the sum of $2,000 he acquired a spacious lot on First Avenue between Redwood and Quince Streets.[65] The lot had an unobstructed view over San Diego Bay and sat in a mostly undeveloped area of town, known today as Bankers Hill. Both the Brandegees grew up on farms and may have considered the quiet, near-rural setting a welcome respite from San Francisco and an ideal place to pursue their work.

Despite the fact that the Brandegees now lived in close proximity to Mexico, T.S. made only one last collecting trip to Baja California after relocating to San Diego. In September 1902, Brandegee returned to the tip of the Baja California peninsula to explore many localities not visited previously. San Diego horticulturist and nursery owner Kate O. Sessions went with him by ship to San Jose del Cabo and by burro into the mountains. The explorers discovered a palm tree that had not yet been described or named for the botanical record. Sessions started back to San Diego about October 22, while Brandegee stayed on well into November.[66]

T.S. may have decided to forgo the hardships of botanizing in Mexico after coming into contact with a relentless cactus collector, the German-born Carl Albert Purpus. Although holding a degree in pharmacy, Purpus collected plants as an occupation. With his brother, the head gardener of the Darmstadt Botanical Garden, he was dispatched to North America in the 1870s to collect for an arboretum. On his own he continued collecting plants in the Americas, marketing seed, pinecones, herbarium specimen, cactus, and anything else that would sell to institutions, commercial concerns or private collectors. While in California, he was referred to Katherine Brandegee for help in identifying plants he did not recognize. He introduced himself by letter, then sent a large number of plants to the Brandegees in San Diego. Katharine promptly responded with the correct botanical names. Purpus was so moved by this act of professional courtesy that he wrote: "I will not sell plants to You, but will be perfectly happy to make a collection for You of all plants You mai desire on my tour next summer." He apologized for his poor English, stating that he had never studied the language.[67]

This was the beginning of a beautiful friendship and a productive partnership. The Brandegees invited Purpus to use their home in San Diego as a base for collecting trips to Mexico and the Southwest. They became his logistical support as he traveled and collected in remote areas of Mexico, as indicated by his letters requesting an emergency loan, thanking the Brandegees for sending him new shoes, asking for paper to dry specimens, and alerting them to plant shipments destined for San Diego.[68] The Brandegees preserved his letters. They are a goldmine of botanical information and open a window on the practical challenges of a

plant collector who might face bandits, revolution, and shipwreck.

Purpus supplied the Brandegees with every plant they wanted from his collecting trips, giving T.S. a continuing supply of new desert plants that he classified and named. While Purpus worked in Mexico, T.S. continued active field work closer to home. A San Diego newspaper reported on the success of an early week-long collecting trip near Julian and Brandegee recounted later in life that he had "carefully botanized San Diego County [and] the Cuyamaca Mountains."[69]

In San Diego: A Garden and a Life

Twenty-one years after the Brandegees left Southern California, Cornell University horticulturist Liberty Hyde Bailey was in San Diego studying palm trees, including *Erythea Brandegeei*, the palm that T.S. Brandegee and Kate O. Sessions introduced to the United States from their 1902 Baja California plant expedition. "My conception of the species," Bailey wrote, "is further clarified by leaf specimens taken by me in 1927 from the top of a tree planted in a ravine by Brandegee on his old place in San Diego at the moment when the tree was being buried by the filling in of the canyon and consequent on the grading of the property by other owners."[70]

This is a sad epitaph for San Diego's first botanical garden. In another time and place heroic efforts might have been undertaken to preserve the valuable and unique plant collection assembled by the Brandegees. That one palm tree disappearing into canyon fill was justification enough. It was growing at the home of the botanist who led the expedition on which the tree was discovered. That same botanist described the tree for science as a new species and, along with Kate O. Sessions, introduced the tree into cultivation in the United States. In 1902, the Brandegee garden was compared with the Missouri Botanical Garden as a place where important investigations could be made on "the living type collections of cacti."[71]

As with any botanical garden, the Brandegees incorporated a herbarium and greenhouse.[72] The bulk of the plants were grown for the purpose of studying and documenting them for classification. As "ardent exponents of the principles of evolution," the Brandegees kept many plants gathered from a wide variety of environments under observation for years. Many of the plants were assumed to be new species, but the Brandegees would not publish them until they had found how those plants behaved in another environment. One author noted, "They made every effort to trace all variants and get their real relationship."[73]

The Brandegees also planted a garden they could enjoy. A large hammock hung among the plants and Katharine kept a pet guinea fowl and tamed birds to eat from her hand. One visiting botanist described the garden as "a botanical paradise, rare flowers blooming on all sides, mockingbirds, quail calling, and other native songbirds making the air musical with song."[74] Another description remarks on the "delightful site on a mesa overlooking the town…[and the] spacious botanical garden filled with rare natives."[75]

The longest and most intimate description of the Brandegees' San Diego garden is found in an obscure and short-lived British publication, *Cactus Journal*. The editor, F.A. Walton, wrote a first-hand account based on his visit to San Diego in 1899:

> The garden of Mr. and Mrs. Brandegee, at San Diego, was well worth seeing. It was almost a wild garden, being situated upon the mesa, or high land overlooking the sea…Mr. and Mrs. Brandegee are enthusiastic botanists, and have built a magnificent herbarium, where they spend most of their time. The wild land round the herbarium is full of interesting plants that are growing in a state of nature, while being studied and described in all their various conditions. I saw a few plants of most of the Californian Cacti, and Mrs. Brandegee has preserved specimens of all the kinds she can get. In some cases where the plants are very rare, I asked how she could so destroy such beauties. She replied that her specimens would be there to refer to at any time, with all its descriptions and particulars, whereas if the plant had been left growing, or sent to some botanical gardens, it would probably have died some time, and all trace have been lost.[76]

Walton continued his account by describing Brandegee as "a born explorer" who divided his time between deserts and mountains, "bringing home plants and seeds to be studied at leisure by himself and his wife." He believed that the Brandegees were doing "good work in this world" because they lived in a house surrounded by a garden and were able to study "both plant and animal life at their leisure." When Walton visited them, he was impressed by T.S. Brandegee's relationship with a nesting humming bird that did not move when approached by visitors. Walton concluded by noting:

> Dr. C.A. Purpus was helping them to classify some of their vast collection, and was quite enthusiastic in his praise of the thorough way in which they did their work. I know when he and I were on the desert or mountain, and we saw any kind of plant he did not know, he would say, 'Ah! I don't know this; I will take a piece back for Mrs. Brandegee, perhaps it will be new to her.'[77]

The Brandegees welcomed visiting plant enthusiasts and botanists during their years in San Diego and established local community ties as well.[78] T.S. is first listed as a member of the City Board of Education in 1897. He apparently served through the next few years. His April 1903 school board election victory is included in the newspaper account of the Republican Ticket's "usual clean sweep."[79]

The Brandegees seemed to have a fair amount of contact with Katharine's sister and the entire eleven-member Stockton family of Ramona. Katharine mentions some of her nine nieces and nephews in various letters. Carl Purpus often asks after "Miss Ora" who apparently lived with the Brandegees part of the time (although that may have been the name of the pet guinea fowl). He mentioned the singing voice of Miss K. Stockton, a niece who was musical director of the San Diego public schools, and inquired after one of the nephews who was believed to be in San Francisco at the time of the 1906 earthquake.[80]

The Brandegees made the acquaintance of local nursery owner and horticulturist Kate O. Sessions. Alice Eastwood knew all three and may have made an introduction. A few months after their arrival San Diego, the Brandegees bought a cinnamon tree, five fuchsias, and a variety of other plants from Sessions' nursery

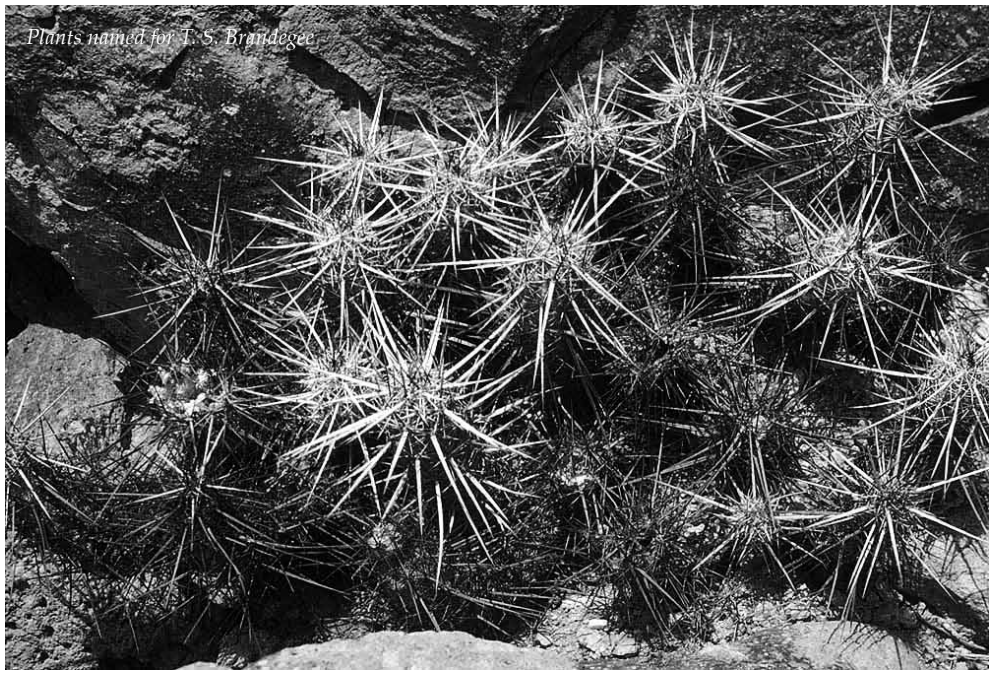


Photo #: P01831 Photographer: Reid Moran Collector: n/a Date: 06 April 1952 Collector No.: 3692 Accession Number: -1 Plant: ***Echinocereus brandegeei*** *Family: Cactaceae State: Baja California Sur Locality: Isla Partida, Espiritu Santo. Photo courtesy San Diego Natural History Museum, Botany Department.*

Photo #: P02191 Photographer: George Lindsay Collector: n/a Date: 13 May 1962 Collector No.: 3063 Accession Number: -1 Plant: ***Mammillaria brandegeei*** *Family: Cactaceae State: Baja California Sur Locality: San Ignacio, 15.2 mi S. Photo courtesy San Diego Natural History Museum, Botany Department.*

business.[81] Sessions accompanied T.S. on one of his Baja California explorations and there is a record of her presenting the Brandegees with one of the first three fern pine trees brought to San Diego.[82]

Sessions most likely convinced T.S. to become involved in the development of San Diego's City Park. He served with her on the Park Improvement Committee in 1904.[83] Additionally, he brought both his areas of expertise to the aid of professional park designer Samuel Parsons, helping with "engineering problems…and the selection of plants to be grown in the park." Brandegee was called "the best informed authority on the flora of Southern California and Lower California," and "a civil engineer of ability and experience."[84] When the *San Diego Union* featured park development stories in its January 1, 1903, issue, T.S. contributed an article describing the many kinds of plants that could transform the look of City Park.[85]

Katharine and Sessions were professional women, not too distant in age, who both shared a strong interest in plant science. The degree of friendship they developed, however, is a matter of conjecture. The letters that they wrote from San Diego to Alice Eastwood—letters that might have shed light on their relationship and provided details about the Brandegees' years in San Diego—were lost in the 1906 San Francisco earthquake.[86] Like Sessions, Katharine certainly was indifferent to housekeeping and dressed for comfort. One visitor described finding her in old leather slippers and a loose Mother Hubbard dress with her graying hair streaming casually down.[87] When plant hunting in the back country, she was once mistaken for an impoverished wanderer and given a free glass of beer by a kindly saloon-keeper. Katharine told this story with amused delight.[88] In contrast, she found it embarrassing to be the guest at an elaborate reception in Salt Lake City.[89] She was modest and self-effacing. She liked people and got along well with a variety of personalities, but she preferred to be free of social conventions and free to do her work.

Despite her demonstrated adaptability, Katharine did not settle well in San Diego. She felt cut off in the sleepy small town and missed the robust libraries and intellectual climate of San Francisco, "the vortex of botanical activity in the West."[90] The secluded garden and herbarium, while supporting an undistracted life of the mind, may have eventually felt too isolated after her years of being at the cutting edge of West Coast science and in the thick of Academy life, whatever the toll of institutional politics. She worked hard on the breeding and care of the plants in her garden but this, too, became tiresome, as indicated by her refusal of a gift of plants for a new garden in Northern California. She hoped never again to have a garden, but "henceforth forever to live in my trunk."[91] Often she did not feel well and blamed the San Diego climate, although her illnesses were more likely associated with a long-term health affliction. Despite her vigor and robustness, she suffered from diabetes for much of her life. She sometimes had to cancel travel plans and once collapsed and nearly died in St. Louis while attempting a cross-country trip.[92] A connection between diet and diabetes had been made, but insulin treatment was not developed during Katharine's lifetime, so the ill effects of the disease could not be controlled. No matter what was going on in their lives during the San Diego years, the Brandegees never stopped working. Katharine wrote to a colleague, "About 2,000 sheets have been put into the herbarium since I came back…there are at least 10,000 sheets out of the herbarium and as soon as they are in place I am going to take a whole day off and read a novel."[93] The years of diligence and informed collecting had an epic payoff: the Brandegees created the

richest private herbaria ever assembled in the United States and much of the work was accomplished in San Diego.

Giving All

As they approached their sixties, the Brandegees began to plan their future and, most importantly to them both, the future of their herbarium. They decided to leave San Diego and return to Northern California, and to parlay their most valuable asset—the herbarium—into a retirement plan. They transferred their collection to the University of California at Berkeley where it would be permanently housed and maintained, and remain perpetually useful to botanical researchers. Their new life looked remarkably similar to their old one for they planned to work in the herbarium every day for the rest of their lives.

The Brandegee gift was big news for the university and for the science world. The *University of California Chronicle* reported:

> Mr. and Mrs. T.S. Brandegee of San Diego have donated their entire botanical collections and library to the University of California. As a result of this gift, the facilities for botanical research at the University are practically doubled, as it now possesses the most complete representation extant of our Pacific Coast flora. [The Brandegees] have for many years given practically their full time to the scientific study of Western American plants…the collection of Asperifoliae…probably cannot be excelled in any collection. The botanical library which comes to the University by this gift is of great value…[and] adds many rare books to the library.[94]

The magazine *Science* called the Brandegees' herbarium, "One of the most important in the west since it contains something over 100,000 sheets of carefully selected plants, mostly representative of the Mexican flora…and of the flora of California and neighboring states. It contains the sole remaining duplicate types of many species, the originals of which were lost in the recent [San Francisco earthquake and fire] that destroyed so large a portion of the California Academy of Sciences….Mr. and Mrs. Brandegee will continue their studies at the university, where Mr. Brandegee has been appointed honorary curator of the herbarium."[95]

Negotiations with the University had been slow and, in some respects, disappointing. The Brandegees knew the value of their herbarium. Its acquisition was a one-time opportunity for the Berkeley campus that would add 76,000 specimens and immediately propel its botanical collection into world-class status.[96] Still, the financially tight University did not make the transfer an easy one. Katharine opened negotiations with an offer to transfer to the Regents of the University, "the whole herbarium and library for $100 per month for the rest of their lives." She received an enthusiastic response from William Albert Setchell, Chair of the Department of Botany, but he warned Katharine that the university would never agree to an annuity. He suggested that the Brandegess propose a lump sum for the sale of the herbarium. The process went on for four long years before Setchell acknowledged receipt of the deed of gift executed by the Brandegees.[97]

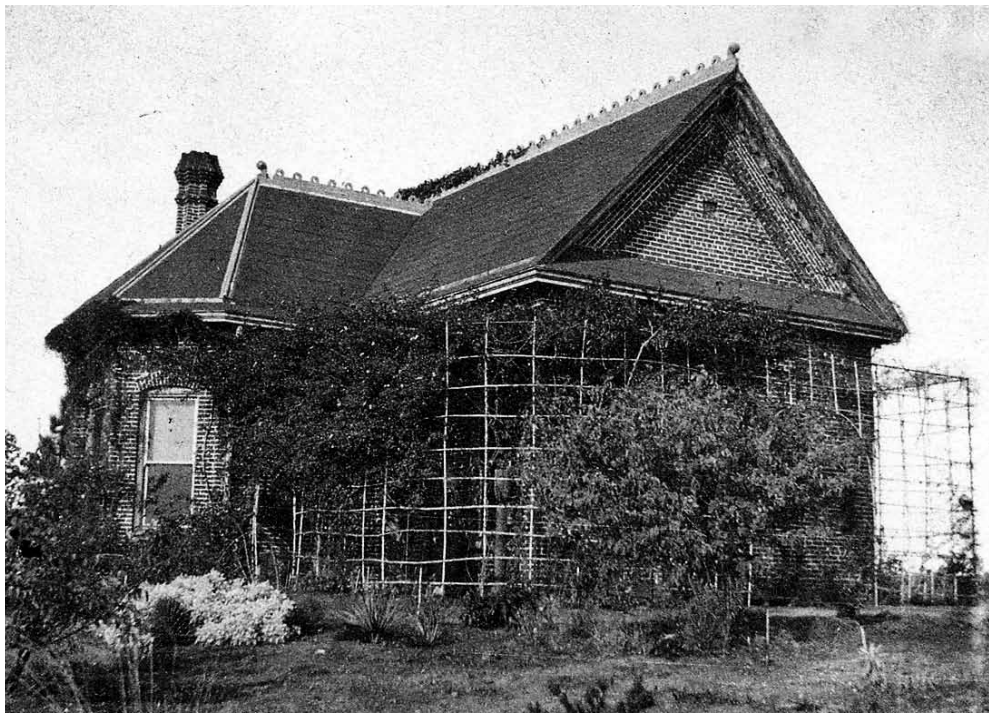
The worn-down and aging Brandegees may have conceded everything to finally close this deal, but the terms of the arrangement are murky. The herbarium

Brandegee herbarium interior. Photo courtesy The University of California and Jepson Herbaria, University of California, Berkeley.

transfer is always called a 'gift' or 'donation' in university literature.[98] The Brandegees were required to bear the cost of shipping the collection, as Setchell claimed institutional poverty. Very late in the process the Brandegees were asked, "Wonder what you intend to do about living, you know I suppose of the scarcity of houses for sale or rent in Berkeley?" Katharine Brandegee was not given the same honorary curator title awarded T.S., although she may have turned down such an offer.[99]

The saving element of the entire transaction came in the form of a kindly young graduate student assigned to the herbarium. Harvey Monroe Hall was charged with shepherding the gift agreement through the university bureaucracy and coordinating the physical transfer of the collection from San Diego to Berkeley.[100] Hall and Katharine Brandegee already had an established correspondence dating back a few years, with friendly and informal letters about plant identification and possible contributions to *Zoe*. Hall generally exhibited tact and solicitousness in his difficult liaison role and adopted a good humored, bantering style in his letters to the Brandegees, who must have been demoralized by the entire enterprise.

Just before the Brandegees were to undertake a cumbersome move from San Diego to Berkeley, the 1906 San Francisco earthquake struck. They were already traveling back and forth a good deal and T.S. was apparently in Berkeley at the time of the earthquake, while Katharine had been delayed in San Diego.[101] The town of Berkeley and the university campus were not severely damaged. Before the end of the year, the Brandegees were settled (perhaps in a university cottage) and working each day at the herbarium. They continued collecting trips in



Brandegee home and herbarium with lattice. Photo courtesy The University of California and Jepson Herbaria, University of California, Berkeley.

California and Nevada. "I am going to walk from Placerville to Truckee," Katharine wrote in 1908 when she was sixty-four years old, "I am unusually strong and well."[102]

About this time, Katharine was struck with an especially bad case of wanderlust. She proposed that they visit Carl Purpus in Mexico or go to Europe. "Perhaps I may yet get Mr. Brandegee across the pond," she wrote to Alice Eastwood. Alternatively, she urged T.S. to follow up on some palm research by botanizing in Chile.[103] Despite her importuning, their travels after relocating to Berkeley were all domestic. Katharine was able to make a long-delayed trip to the East Coast to study early type specimens of California plants. When at home, the Brandegees worked every day at the herbarium. A younger botanist who knew them only during the Berkeley years found that the Brandegees had "the same indomitable love of arduous critical thinking that characterized them in earlier life."[104]

Their unlikely romance endured. Late in life they were described as "completely in love and entirely devoted to each other."[105] They continued their companionable togetherness and their independent scientific work until illness and death overcame them. Katharine died in 1920 at age seventy-five. The eighty-two-year-old T.S. followed her in 1925.[106]

The story of the Brandegees and their important work has been an unfortunate omission from the history of San Diego. The region should claim these eminent scientists as their own and celebrate the mutual benefits derived from the years that Katherine and Townshend Stith Brandegee made their home in Bankers Hill overlooking San Diego Bay and the ocean beyond.

NOTES

1. Diana Lipscomb, "Women in Systematics," *Annual Review of Ecology and Systematics* 26 (1995), 336.
2. The Brandegees had a different attitude from the anti-Gray posture adopted by Edward Lee Greene who disagreed with Gray on the application of Darwinian thought to botany and resisted the Linnaean nomenclature that gained acceptance in the last quarter of the nineteenth century. Robert P. McIntosh, "Edward Lee Greene: The Man," in Frank N. Egerton, ed., *Landmarks of Botanical History. Edward Lee Greene* (Stanford: Stanford University Press, 1983), 38. A new plant must be botanically "described" or "published" according to certain detailed standards to win scientific acceptance. Preserved specimens of described plants are then deposited in a herbarium on "sheets," open to inspection by others. It was traditional for most new species to be sent to Asa Gray at Harvard for evaluation and approval and Gray delegated a good deal of the work to Sereno Watson. Approval was not guaranteed, the process was slow, and the final result was often short on important descriptive information on growth habits, habitat, range, and other significant factors. James L. Reveal, "Botanical Explorations in the American West—1889-1989: An Essay on the Last Century of a Floristic Frontier," *Annals of the Missouri Botanical Garden* 78, no. 1 (1991), 73.
3. Brandegee publications are documented in Edmund C. Jaeger, *Son of the Living Desert* (Loma Linda: Loma Linda University, 1998), 48, note 32.
4. Christopher K. Frazier, "The Botanical Brandegees and Their Eponyms," *The New Mexico Botanist* 16 (December 6, 2000), 3. As Asa Gray aged, he was said to be increasingly rigid and controlling, such an impediment to the publication of new species that it riled western scientists. Reveal, "Botanical Explorations in the American West," 73.
5. Unless otherwise noted, two sources have been relied upon for general biographical information: "Brandegee, Mary Katharine Layne (1844-1920)," *Biographical Dictionary of Women in Science: Pioneering Lives from Ancient Times to the Mid-20th Century* (New York: Routledge, 2000), vol. 1, 171 and "Brandegee, Mary Katharine Layne Curran (October 28, 1844-April 3, 1920)," in *Notable American Women: 1607-1950* (Cambridge, MA: Harvard University Press, 1971), http://www.credoreference.com.sally.sandiego.edu/entry/78210337 (accessed December 12, 2008).
6. Marcus E. Jones, "Katherine [sic] Brandegee, Part I," *Desert Plant Life* 4, no. 4 (August 1932), 41; Jones, "Botanists I Have Known: Mrs. T.S. Brandegee," 18, *Contributions to Western Botany* (1933), 13.
7. Jones, "Katherine [sic] Brandegee, Part I," 41.
8. Richard G. Beidleman, *California's Frontier Naturalists* (Berkeley: University of California Press, 2006), 429; William Albert Setchell, "Townshend Stith Brandegee and Mary Katharine (Layne) (Curran) Brandegee," *University of California Publications in Botany* 13, no. 9 (1926), 156-57.
9. School teacher Lucy Wanzer enrolled in 1876 became the first female graduate of the medical school. "History of UCSF," http://history.library.ucsf.edu/1868_hospitals.html (accessed August 30, 2009).
10. Elizabeth Rush, "On Her Terms: Katharine Brandegee: First Woman of Western Botany," *Pacific Discovery* 50, no. 1 (Winter 1997), 24.
11. The California College of Pharmacy was founded in 1872 in San Francisco. Dr. Hans Herman Behr was named Professor of Botany. In the next year, the College affiliated with the University of California. Although Behr never moved to the new Berkeley campus, the Regents granted him the title Emeritus Professor of Botany in 1894. Lincoln Constance, *Botany at Berkeley: The First Hundred Years* (Berkeley: Botany Department, University of California, 1978), 2.
12. See generally, Barbara Ertter, "The Flowering of Natural History Institutions in California," *Proceedings Of The California Academy Of Sciences* 55, Supp. I, no. 4 (October 18, 2004): 58-87.
13. California Academy of Sciences, *Dr. Hans Herman Behr* (San Francisco: The Academy, 1905), 4-6.
14. Beidleman, *California's Frontier Naturalists*, 430.
15. Barbara Ertter, "Mein Lieber Herr College: Letters From Behr to Englemann," *Fremontia* 31, no. 1 (January 2003), 19. The students studied plant life in Marin, Costa Costa and San Mateo

Counties, taking items of interest back to the Academy of Sciences. "Mrs. Curran was a very close student and observer."

16. Rush, "On Her Terms," 24.

17. Emanual D. Rudolph, "Women in Nineteenth Century American Botany: A Generally Unrecognized Constituency," *American Journal of Botany* 69, no 8 (September 1982): 1346-1355.

18. Rush, "On Her Terms," 24. The other was Elizabeth Gertrude Knight (Britton), a teacher in natural science at Normal College in New York City, later Hunter College.

19. Setchell, *Publications in Botany*, 176.

20. Rush, "On Her Terms," 26. "Naming or having a new plant named for the discoverer provided instant immortality," but sending the plant to Asa Gray could mean losing credit for the find. Nancy M. Slack,"Botanical Exploration of California from Menzies to Muir (1786-1900) with Special Emphasis on the Sierra Nevada," in *John Muir: Life and Work*, ed. Sally M. Miller (Albuquerque: University of New Mexico Press, 1993), 225.

21. "Brandegee," *Notable American Women.*

22. Leslie Madsen-Brooks, "Challenging Science As Usual: Women's Participation in American Natural History Museum Work, 1870-1950," *The Journal of Women's History* 21, no. 2 (2009), 23.

23. A full account of this controversy can be found in Ertter, "The Flowering of Natural History Institutions," 67.

24. Willis Linn Jepson saw Katharine Curran as scheming and vindictive, contending that ten years of Academy dissension, from 1875-85, were "engineered" by her. Joseph Ewan, "San Francisco as a Mecca for Nineteenth Century Naturalists," in *A Century of Progress in the Natural Sciences 1853-1953* (San Francisco: California Academy of Science, 1955), 33.

25. This achievement is placed in perspective by Margaret W. Rossiter, *Women Scientists in America: Struggles and Strategies to 1940* (Baltimore: Johns Hopkins University Press, 1982), 59, pointing out that most paid employment for women in nineteenth century botany was as illustrators or for piece-work, not fully functioning scientists.

26. Richard Urquhart Goode, *The Goode Diary: A Personal Journal of the Northern Transcontinental Survey,* ed. C. W. Tazewell (Virginia Beach: W. S. Dawson Co., 1883), http://www.geocities.com/Athens/Parthenon/7933/gde-dy.html (accessed August 8, 2005).

27. Katharine Brandegee (KB) to Francesco Franceschi, February 24, 1904, Francesco Franceschi Papers 1904-1918, BANC MSS 70/11c, Bancroft Library, University of California, Berkeley.

28. Except as otherwise noted, biographical information is from "Brandegee, Townshend Stith, 1843-1925," in *Concise Dictionary of American Biography, 2nd Ed*., ed. Joseph G. E. Hopkins (New York: Charles Scribner's Sons, 1977); and "Townshend Stith Brandegee," in *Dictionary of American Biography Base Set* (New York: American Council of Learned Societies, 1928-1936), reproduced in Biography Resource Center (Farmington Hills, MI: Gale, 2008) http://www.galenet.galegroup.com.sally.sandieg.edu:80/servlet/BioRC (accessed October 10, 2008).

29. Brandegee served in the First Regiment of the Connecticut Artillery, Company G. His service in an artillery unit may have contributed to his deafness in later life. It was said that his increasing deafness "isolated him more and more after he came to live in California." Ewan, "San Francisco as a Mecca," 33.

30. Ferdinand Vandeveer Hayden, a geology professor, for many years led the United States Geographical and Geological Survey of the Western Territories. Hayden's expeditions mapped and surveyed extensively in Colorado, Utah, Wyoming and other future states, and employed topographers, engineers, naturalists, artists, photographers and scientists with various specialties. His obituary discusses this work: "Ferdinand Vandeveer Hayden," *Science* 11, no. 257 (January 6, 1888): 1-2. Geological surveys became a means for botanical explorations, but often with an amateur collecting plants in his spare time. Gradually more survey teams included a member dedicated to plant collection and botanical study. James L. Reveal and James S. Pringle, "Taxonomic Botany and Floristics in North America North of Mexico: A Review," in *Flora of North America North of Mexico Vol. I* (New York: Oxford University Press, 1993): 157-192.

31. Beidleman, *California's Frontier Naturalists*, 431. The Morris Ketchum Jesup Collection of North American Woods was inaugurated by Jesup when he assumed the presidency of New York's American Museum of Natural History in 1881. Collectors were expected to supply tree trunks of at least six feet in length. William Adams Brown, *Morris Ketchum Jesup: A Character Sketch* (New York: Charles Scribner's Sons, 1910), 163-166.

32. Jaeger, *Son of the Living Desert*, 47; "Townshend Stith Brandegee," *Dictionary of American Biography.*

33. One friend claimed to be embarrassed by their displays of affection while all three were out botanizing (Beidleman, *California's Frontier Naturalists*, 431) while Marcus Jones, who today would be labeled a sexist, wrote: "It was surely a droll affair, a most intensely masculine woman desperately in love with the most retiring and effeminate man, and both of them dead in earnest about it, the man too with other women buzzing around him." Jones, *Contributions to Western Botany*, 17. Katharine's confession of love was in a letter written to an unidentified sister, most likely to Susan Layne Stockton of Ramona. Jones, "Katherine [sic] Brandegee, Part II," 51.

34. Ibid. Today's purchasing power of Brandegee's $40,000 inheritance would be about $900,000, http://www.measuringworth.com/calculators/uscompare/result.php (accessed September 15, 2009).

35. [News], *West American Scientist* 6, no. 45 (July 1889): 82; Jaeger, *Son of the Living Desert*, 47. This honeymoon walk is reported in multiple sources, but never with logistical details. It is unknown whether they camped or took a pack mule or exactly how they managed to carry the preservation materials and species collected.

36. Five volumes of *Zoe* were published from 1890 to 1908. It began as a monthly, then adopted a more manageable quarterly publication schedule, with the last numbers trickling off the press over a period of years. Although it felt safest to list T.S. as the editor, Katharine and Alice Eastwood accomplished the editorial work and each eventually received credit as the editor of one or more volumes of the journal. Despite Katharine Brandegee's exceptional rise, this was an era when sexual discrimination actively suppressed the achievement of women scientists. Rudolph, "Women in Nineteenth Century American Botany," 1346.

37. A new Assistant in Botany at the University of California could not resist a snide characterization of the club as a gathering of many "ladies who are interested in ferns and flowers," but admitted that some well known botanists were involved and that there was value in educating more people for the work of collecting and exploration. Willis L. Jepson, "Botanic Clubs in California," *Botanical Gazette* 16, no. 10 (October 1891), 296-97. In some sources, the founding of the club is dated to 1892, but since Jepson wrote his critique late in 1891, that seems to be the correct year.

38. Fieldwork was essential to systematic botany, but many women could not leave home for weeks at a time as Katharine Brandegee did. Her protégé and California's other great woman botanist, the prodigious field collector Alice Eastwood, never married and like Brandegee had no children. Their personal freedom to conduct fieldwork illustrates a point made in a book about women in biology: "It was nearly logistically impossible for a married woman with children to carry out original research" in the nineteenth century. Nancy G. Slack, "Nineteenth-Century American Women Botanists: Wives, Widows, and Work," in *Uneasy Careers and Intimate Lives: Women in Science 1789-1979*, ed. Pnina G. Abir-Am and Dorinda Outram (New Brunswick: Rutgers University Press, 1987), 84.

39. Katharine Brandegee was on a vessel that ran onto rocks near San Pedro in heavy fog. On another occasion, she broke her leg while collecting plants in the mountains and had to be carried many miles over rough trails before reaching medical attention. Edmund C. Jaeger, "Bold Kate Brandegee," *Calico Print* (March 1953), 8. T.S. Brandegee did not actually experience a shipwreck, but was dangerously close to it when strong surf rolled the revenue cutter assigned to land him and a companion on San Clemente Island where he was collecting for the Smithsonian. "At San Clemente: Experiences of Two Naturalists in Search of Specimens," *San Diego Union*, September 2, 1894, 5:4.

40. Slack, "Botanical Exploration of California," 222; Elizabeth Rush, "Katherine [sic] Layne Curran Brandegee, An Uncompromising Rebel," *Fremontia* 32, no. 2 (April 2004), 25-26.

41. "Meetings: Speaker: Carol Green Wilson, Date: January 23, 1953," *California Historical Society Quarterly* 32, no. 2 (June 1953), 182. Wilson interviewed Eastwood for the story of her life.

42. On January 18, 1892, the business records of the California Academy of Science stated: "Council reports that they have acquired the services of Miss Alice Eastwood for the term of six months at a salary of $50 per month to mount the plants in the herbarium." *Theodore Henry Hittell's The California Academy of Sciences A Narrative History: 1853-1906*, ed., rev., enlg. Alan E. Leviton and Michele L. Aldrich (San Francisco: California Academy of Sciences, 1997), 334.

43. "Meetings: Speaker: Carol Green Wilson," 182.

44. *Theodore Henry Hittell's The California Academy of Sciences,* 337-38.

45. Eastwood worked until age ninety, retiring from the Academy of Sciences in 1949. Beidleman, *California's Frontier Naturalists*, 431.

46. Joseph Ewan, "Bibliographical Miscellany, IV. A. Bibliographical Guide to the Brandegee Botanical Collections," *American Midland Naturalist* 2, no. 3 (May 1942), 773.

47. KB to Harvey Monroe Hall, January 1, 1901, Harvey Monroe Hall Papers, 1859-1991, BANC MSS C-B 908, Bancroft Library, University of California, Berkeley.

48. [News], *Botanical Gazette* 15, no. 5 (May 1890), 125. According to one interpretation, Katharine Brandegee's aim was to "make the work of western botanists acceptable by eastern standards." Marcia Myers Bonta, *Women in the Field: America's Pioneering Women Naturalists* (College Station: Texas A&M University Press, 1991), 91.

49. Beidleman, *California's Frontier Naturalists*, 379-80.

50. Robert P. McIntosh, "Edward Lee Greene: The Man," in *Edward Lee Greene, Landmarks of Botanical History Part 1*, ed. Frank N. Egerton (Stanford: Stanford University Press, 1983), 65.

51. Beidleman, *California's Frontier Naturalists*, 430. Time has served Greene well in that some of his dubious species have proven to be true. Rogers McVaugh, "Edward Lee Greene: An Appraisal of His Contributions to Botany," in *Edward Lee Greene, Landmarks of Botanical History,* 61.

52. Whether Greene actually held an official appointment at the Academy is unclear, but he may have been called an assistant curator. One unsubstantiated account suggested that Katharine Curran attacked Greene out of spite because he had not returned her love interest in him. Ewan. *Bibliographic Miscellany*, 772-89. An elderly scientist who knew the facts was outraged by this unrequited love theory which he considered a ridiculous suggestion. Albert W.C.T. Herre, "Katherine [sic] Brandegee. A Reply to a Fantasy by J. Ewan," (published by the author, University of Washington, 1960); Greene's treachery is described in Beidleman, *California's Frontier Naturalists*, 430; and he had other critics: Frank S. Crosswhite and Carol D. Crosswhite, "The Plant Collecting Brandegees, With Emphasis on Katharine Brandegee as a Liberated Woman Scientist of Early California," *Desert Plants* 7, no. 3 (1985):137-39. Katharine Brandegee was not the only Greene critic who could not resist a personal bias in writing about him. Botanist Marcus E. Jones called Greene "a pest, a botanical crook and a cur" whose botanical leaflets were so poorly done that it made [Jones] feel like "committing murder." Rogers McVaugh, "Edward Lee Greene: An Appraisal of His Contribution to Botany," 54-55. Jones also called Greene a "reprobate" who indulged in "egotistical self-praise." Jones, "Katherine (sic) Brandegee, Part II," 70.

53. Rush, "On Her Terms," 22.

54. Setchell, "Townshend Stith Brandegee and Mary Katharine (Layne) (Curran) Brandegee," 166.

55. Jones, *Contributions to Western Botany*, 17. Many contemporaries and later observers thought that Katharine Brandegee was completely equipped to write a flora of California and occasionally express disappointment that she did not do so. One suggestion is that her perfectionism was—for the purposes of such a large project—a fatal flaw that kept her from tackling this career capstone. Peter Wild, "Kate Brandegee: Rebel with a Fatal Flaw," *Wildflower* 14, no. 4 (Autumn 1998), 42-44.

56. [News], *West American Scientist* 6, no. 45 (July 1889), 82. Field notes are important because botanists want to know not only that a plant is found in one location, but how far and wide the same plant can flourish and whether it develops significant variations under different growing conditions. Before global positioning satellites pinpointed locations, descriptive field notes recorded geographical landmarks. Years after his Baja California trips, plant scientists returned to the field notes of T.S. Brandegee to help them locate specimens. Unfortunately, clear and complete field

notes were not a Brandegee strength, as revealed in: Reid Moran, "Brandegee's Tarweed and the True Story of Its Recovery," *Environmental Southwest* 440 (January 1972): 3-6.

57. Moran, "Brandegee's Tarweed," 3.

58. Slack, "Botanical Exploration of California," 222.

59. Jaeger, *Son of the Living Desert,* 49; Edmund C. Jaeger, "Bold Kate Brandegee," *Calico Print* (March 1953), 8.

60. When contemporary historians look comprehensively at United States activity in Latin America, Brandegee's botanical work in Baja California and the Mexican states of Puebla, Sinaloa, Sonora, and Veracruz is remembered. David Shavit, *United States in Mexico: A Historical Dictionary* (New York: Greenwood Press, 1992), 40-41. When the flora of Mexico is discussed, Brandegee is one of seven "relevant botanists" named as having made important collections. Laura Arriaga, Elizabeth Moreno and Claudia Aguilar, "An Overview of the Floristic Richness and Conservation of the Arid Regions of Northern Mexico," [Washington, D.C.]: USDA Forest Service Proceedings, RMRS-P3, 2005, 171, http://www/fs/fed.us/rm/pubs/rmrs_p036/rmrs_p036_171_pdf (accessed September 25, 2008).

61. "Brandegee, Townshend Stith," *Concise Dictionary*; Moran, "Brandegee's Tarweed," 3.

62. "The Brandegee Herbarium and Library," *University Record, The Graduates* [no vol., no date, unpaged], Brandegee Papers, California Academy of Sciences, San Francisco. Brandegee had become intensely interested in the Mexican flora and took up residence in San Diego "in order to study more conveniently." Katharine Brandegee's sister Susan married a Mr. Stockton and had nine children. Jones, *Contributions to Western Botany,* 12.

63. Barbara Eritter, "People, Plants, and Politics: The Development of Institution-Based Botany in California 1853-1906," in "Cultures and Institutions of Natural History," *California Academy of Sciences Memoir 25* (2000), 236.

64. Francesco Franceschi to KB, March 3, 1894, Brandegee Collection, University & Jepson Herbaria, University of California, Berkeley.

65. County of San Diego [California], Deed Book 229, "Frank B. Yoakum et. al. to Townshend S. Brandegee [April 26, 1894, deed of sale for First Avenue property]." The Brandegees arrived in San Diego before this purchase, but their temporary living arrangements are unknown.

66. Reid Moran, "The Mexican Itineraries of T. S. Brandegee," *Madroño* 11, no. 6 (May 9, 1952), 258. This trip was dated by Kate O. Sessions late in her life as having occurred in 1900, but records of plant finds indicate that it was 1902.

67. Barbara Ertter, "On the Trail, with Purpus, in California," University & Jepson Herbaria, University of California, Berkeley, http://ucjeps.berkeley.edu/Purpus/html (accessed May 2, 2009).

68. Carl A. Purpus (CAP) to T.S. Brandegee (TSB), March 25, 1905; February 7, 1906; June 6, 1907; March 17, 1905, and CAP to KB, March 12, 1903, Collected Letters of C.A. Purpus, 1896 to 1907, University & Jepson Herbaria, University of California, Berkeley, http://ucjeps.berkeley.edu/Purpus/letters.html (accessed December 5, 2008) (hereafter Collected Purpus Letters).

69. "Collecting Botanical Specimens," *San Diego Union*, June 25, 1894, 5:3; Townshend Stith Brandegee, "Autobiographical Notes," written at the request of Mrs. Carlotta Case Hall, August. 1931 [typescript], Townshend Stith Brandegee Papers, California Academy of Sciences, San Francisco.

70. H.L. Bailey, *Gentes Herbarum* 4 (1937), 106.

71. William Trehase, "Some Botanical Gardens: The Missouri Botanical Garden," *Plant World* 5, no. 1 (January 1902), 3. Marcus E. Jones later wrote that the Brandegee's "place was sold to the city for a botanical park but fell into neglect," but no documentation supporting this claim has come to light. Jones, "Katherine [sic] Brandegee, Part I," 41. Students enrolled in the Bishop's day school that eventually occupied the Brandegee property were sometimes sent out to study the exotic plantings and occasionally gathered under the shade of a tree for an outdoor class. "There were all kinds of strange and beautiful things in the Brandegee gardens," a former student recalled. Alice Heynemann (1895-1974), interviewed September 16, 1972, Oral History Collection, San Diego Historical Society.

72. The garden and herbarium are described in various accounts and captured in photographs, but only Carl A. Purpus mentions the greenhouse. CAP to KB, January 16, 1898.

73. Herre, "Katherine (sic) Brandegee: A Reply to a Fantasy," 3. Herre contrasts the approach of Katharine Brandegee and Edward L. Greene (who rejected the theory of evolution).

74. Jones, *Contributions to Western Botany*, 18.

75. Beidleman, *California's Frontier Naturalists*, 432.

76. F. A. Walton, "Twenty-Thousand Miles in Search of Cacti," *Cactus Journal* 2 (1889), 116-17. Walton was a Birmingham, England, cactus dealer who edited this magazine for British cactus enthusiasts.

77. Ibid.

78. "Townshend Stith Brandegee," *Science* 61, no. 1583 (May 1, 1925), 464. Visitors came to study plants and also contributed to the variety in the garden. When asked to identify a plant for Santa Barbara horticulturist Francesco Franceschi, Katharine Brandegee wrote, "We have this *Tithonia* in our own garden, Abrahams brought it from Guatemala." KB to Francesco Franceschi, February 24, 1904, Franceschi Papers, Bancroft Library.

79. "City Board of Education," *San Diego City and County Directory, 1897;* Brandeegee got 102 votes in his precinct while his closest rival received 63 votes. "The Usual Clean Sweep by the Republican Ticket," *San Diego Union*, April 8, 1903, 6:1-6. A final count increased his vote tally to 224 votes. "Mayor Frary For Another Two Years," *San Diego Evening Tribune*, April 8, 1903, 3.

80. CAP to KB, February 11, 1901 and July 6, 1902, Collected Purpus Letters.

81. Invoice for items sold to T.C. Brandegee from the San Diego Nursery, Brandegee Papers, University & Jepson Herbaria, University of California, Berkeley.

82. The fern pine tree is ubiquitous in San Diego today and was recently renamed from *Podocarpus gracilior* to *Afrocarpus gracilior*. Nancy Carol Carter, "The Fern Pine's Voyage," *Pacific Horticulture* 67, no. 1 (January/February/March 2006): 7-9.

83. "Laying Out 1400-Acre City Park," *San Diego Union*, January 1, 1904, 32:1-5.

84. Daniel Cleveland, "Recounts Story of Balboa Park's Steady Development," *San Diego Union*, June 27, 1926, 18:5-6.

85. T.S. Brandegee, "Many Kinds of Plants: Some Species That Do Well in this Locality," *San Diego Union*, January 1, 1903, 25.

86. Alice Eastwood's San Francisco home burned to the ground and her office was destroyed when the California Academy of Science building collapsed then burned.

87. Jones, "Katherine [sic] Brandegee, Part I," 43.

88. Jaeger, *Son of the Living Desert*, 49.

89. While Katharine was in Salt Lake City studying plants collected by Marcus E. Jones, the wife of one of T.S.'s Yale classmates became aware of her presence and organized an elaborate reception with all the local celebrities. In Jones' account, Katharine "dolled herself up as much as she could for the occasion…and she was lionized very much." She kept her temper and was polite to all "but it was intensely disagreeable to her and she breathed a great sigh of relief" when it was over. She had no sense of how others viewed her achievements. "I was very much amused at her absolute self-abnegation." Jones, "Katherine [sic] Brandegee, Part I," 45.

90. Rush, "On Her Terms," 27; Jones, *Contributions to Western Botany*, 18.

91. KB to Francesco Franceschi, September 19, 1906, Brandegee Papers, University & Jepson Herbaria.

92. KB to Harvey Monroe Hall (Hall) (undated but annotated "Rec'd April 1, 1902."), Brandegee Papers, University & Jepson Herbaria. Brandegee wrote that her "work has been put back at least six months by circumstances beyond my control," most likely a reference to health problems. Purpus, obviously responding to reports of Katharine's illnesses, often inquired after her. CAP to TSB, August 1, 1903; June 24, 1905; March 8, 1906, Collected Purpus Letters. Katharine's St. Louis

collapse is recounted in Beidleman, *California's Frontier Naturalists*, 433.

93. KB to Hall, Spring 1901, Harvey Monroe Hall Papers, Bancroft Library.

94. "The Brandegee Herbarium and Library," [Reprinted from the University of California *Chronicle* 9, no. 1 (January 1907)], *University Record The Graduates*, University of California, 73-75. Townshend Stith Brandegee Papers, California Academy of Sciences, San Francisco.

95. "Scientific Notes & News," *Science New Series* 24, no. 620 (November 16, 1906), 638.

96. Barbara Ertter, "Two Million and Growing," *Jepson Globe* 15, no. 2 (September 2004), 8.

97. The contents of this offer from the Brandegees to the University are reported in Ertter, "People, Plants, and Politics," 239. The reply and eventual transfer document were from William A. Setchell (WAS), to KB, January 19, 1901 and September 5, 1906, Brandegee Papers, University & Jepson Herbaria.

98. The final written agreement could not be located, although a document specifying terms surely resides somewhere in University files. Compensation may have included residence at University Cottage No. 2 where the Brandegees were living in 1908, although no documentation on the campus cottages could be located in the University archives. The address was found on a letter. Secretary to the President to TSB, September 8, 1908, University of California (System) Office of the President, Records, Alphabetical Files, 1885-1913, CU-5 Series 1, Box 20, Folder 164, Bancroft Library, University of California, Berkeley. The importance of the gift is described in university literature, along with a short biography of each of the Brandegees and the promise that every opportunity would be offered Mr. and Mrs. Brandegee to continue their studies without interruption. The only list of the important books that were a part of the donation is found in 'Gifts to the University: The Brandegee Herbarium and Library," *University of California Chronicle, An Official Record, Volume IX* (Berkeley: The University Press, 1907), 73-76.

99. Shipping costs, Setchell to KB, September 5, 1906, and housing, Hall to KB, September 1, 1906, Brandegee Papers, University & Jepson Herbaria. Botany Department Chair Setchell stated that Katharine Brandegee "sought no official recognition or personal commendation." Setchell, "Townshend Stith Brandegee and Mary Katharine," 167-68.

100. Ernest Brown Babcock , "Harvey Monroe Hall," *University of California Publications in Botany* 17 no. 12 (June 23, 1934), 356.

101. Purpose wrote that he was "very glad to hear that you have arrived in Berkeley." CAP to TSB, April 10, 1906; and "I was so glad to hear from Mr. Brandegee that you escaped that frightful disaster in San Francisco," CAP to KB, May 1, 1906, Brandegee Papers, University and Jepson Herbaria.

102. Elizabeth H. Oakes, "Brandegee, Mary Katharine Layne ('Kate')," *Science Online* www.fofweb.com.sdplproxy.sandiego.gog/Sceince/MainDetailPrint.asp?iPin=EWS (accessed August 28, 2008).

103. KB to Alice Eastwood, August 18, 1911, Alice Eastwood Papers, California Academy of Sciences, San Francisco; KB to Francesco Franceschi, September 20, 1905, Franchesci Papers, Bancroft Library.

104. Jaeger, "Bold Kate Brandegee," 33.

105. Crosswhite and Crosswhite, "The Plant Collecting Brandegees," 131. The Brandegees are identified as one of the more successful science partnerships in *Creative Couples in the Sciences*, ed. Helena M. Pycior, Nancy G. Slack, and Pnina G. Abir-Am (New Brunswick: Rutgers University Press, 1996).

106. "Obituary [T. S. Brandegee]," *Science, New Series* 61, no. 1583 (May 1, 1925), 464.