

# Ninety Years After Greene

Eugene Jercinovic

The name of Edward Lee Greene (1843 – 1915) must certainly be familiar to anyone involved with the botany of New Mexico. The name resounds throughout American botany, sometimes with the ring of a dynamic pioneer of plant science, sometimes with the strident dissonance of a man out of step with his peers. Few figures in the history of the science are more colorful and controversial. Greene spent considerable time in New Mexico where some of his best work was accomplished. His first extended stay in Silver City so impressed him that he published a fascinating account in *The American Naturalist* in March 1878. His description of what is now known as *Astragalus allochrous* immortalizes a quintessential image of southwestern New Mexico.

“The other is also an *Astragalus* (*A. trifloris* Gray), producing almost white and very thin membranous pods of oblong shape. These when mature fall from the stem without opening to discharge their seeds, and are tossed about over the plains by every wind; sometimes lying in heaps under the lee of bushes and tufts of grass or other herbage. These harmless toys of the winds had, before I was accustomed to their ways, to my nerves, a singular little faculty of suggesting evil, the effect of which might slightly have amused a witness, had there been one. The weed gatherer on these plains needs to be always on the look-out for rattlesnakes; one of these reptiles may be lying coiled up under or near by any plant which he steps aside to examine or collect. The warning rattle is a sound he is familiar with. Now while he bends over some novel and interesting plant, absorbed in contemplating its peculiarities, or busily preparing specimens of it for his port-folio, let a passing breeze set in motion one of these bladdery capsules, and as it tumbles near with its detached seeds rattling within, ten to one he will be startled with the idea that a serpent is at his heels. The sound of the rattlesnake is very perfectly reproduced by the moving dry astragalus pod and seeds.”

## His Life

Edward Lee Greene was born on August 20, 1843 in Hopkinton, Rhode Island, about thirty miles southwest of Providence. Even as a young child, he displayed an attraction to plants. One of his earliest books was Mrs. Lincoln’s *Lectures on Botany* (Mrs. Almira Hart Lincoln Phelps, 1842), which introduced lessons in botany in a strongly religious context, foreshadowing the interplay of these domains in Greene’s life. In 1855 the family moved to Illinois and soon thereafter to Albion in southern Wisconsin.

In 1859, Greene began studies at the Albion Academy, a coeducational institution with essentially collegiate standing at this time. The Academy, founded by Seventh Day Baptists, had a distinct religious emphasis. In 1860, Greene met Thure Kumlien, a Swedish naturalist who had graduated from the University of Uppsala (the alma mater of Linnaeus), who, though more interested in ornithology, was well versed in the study of

plants. Groups of Albion students took field trips with Kumlien, who lived nearby. Kumlien greatly stimulated Greene's fascination with plants and awakened an interest in classical and modern languages which Greene maintained throughout his life. Greene's association with Kumlien continued until Kumlien's death in 1888.

In August 1862, Greene, along with his father and two brothers, joined the Thirteenth Wisconsin Infantry of the Union Army. Although he saw little actual combat, his stint in the army took him through Tennessee, Kentucky, and Alabama where he continued examining and collecting plants. He carried with him Alphonso Wood's *Class Book of Botany*. Greene was not a committed military man and preferred tramping about in search of plants in his spare time. He was disturbed by the gambling and what he considered to be the general moral depravity of his fellow soldiers. He never rose above the rank of Private. He served until July 13, 1865.

After his release from the army, he returned to the Academy, graduating with a Bachelor of Philosophy in 1866. With credentials in hand he began teaching in rural Illinois communities near Decatur. Greene found his students enjoyable and reasonably well-behaved. He was able to earn fifty to eighty dollars a month. He continued his pursuit of plants and dabbled in other aspects of natural science such as taxidermy. He boarded with local families. In one case, he lived with a German family long enough to master the language sufficiently to be hired to teach it at the Albion Academy in 1869. Disagreement with the school's administration, however, precipitated a rapid resignation, and his return to Illinois.

By early 1870, Greene rekindled an idea he had originally conceived while in the army to make his home west of the Mississippi River. He contacted both Asa Gray in Cambridge and George Engelmann in St. Louis to obtain appropriate literature for his botanical researches in the west. Gray and Engelmann were supportive and expressed interest in specimens. By April, Greene had arrived in the Denver area. He spent the summer of 1870 exploring and collecting plants in the Denver area. In the fall his latent spirituality reawakened. Greene was raised in a Baptist family, although not in an environment of devout passion. He had been a Methodist in Illinois. In Colorado he decided to become much more serious about his religious side. He visited the Bishop of the Episcopal Church in Denver and by early 1871 had decided to undertake the dual roles of teacher of botany and candidate for the holy order at the recently established seminary, Jarvis Hall in Golden Colorado. In September 1871 he was admitted to the Sacred Order of Deaconry and took charge of a congregation in Greeley, Colorado. At the end of January 1873 Greene was ordained a priest and became the pastor of a church in Pueblo, Colorado.

Greene's botanical pursuits were somewhat reduced during this period. He did, however, continue correspondence with Gray. In 1872 when Gray was planning a visit to Colorado, he invited Greene to come along. Gray and Greene met on August 10, 1872 at Empire City, Colorado. On August 12 Greene joined Gray, Charles Christopher Parry and others in a climb of Parry's Peak and two days later, August 14, a climb of Gray's Peak. He described Gray as "most delightful." This adventure enabled Greene to develop a friendship and correspondence with Parry.

In February 1874 Greene assumed pastorship of a church in Vallejo California, not far from San Francisco. By April 1875 he was back in Colorado as rector of a church in Georgetown. In March 1876 he had moved to Yreka California as a missionary. In the spring of 1877 Greene took a trip through Arizona and into southwestern New Mexico. He stayed in the Silver City area through the summer, fascinated with the Mogollon Mountains. Greene's visit to Silver City was noted in the Silver City Independent October 3, 1933. In an article reviewing the history of the parish on its sixtieth anniversary Dr. Ross Calvin, rector, stated:

“After a sojourn of some months, this unusual clergyman [Rev. Barstow, a clergyman from Las Cruces] was followed by another still more unusual, the Rev. Edward Lee Green (sic), who according to the record ‘came unexpectedly into town, walking and botanizing – all the way from San Diego, California.’ He had an appointment from the U. S. government to collect desert plant life for the Centennial Exposition then going on in Philadelphia. He settled in the town, says the Parish Register, without any authorization from the Bishop, held services for a few months, and then passed on.”

Upon his departure, the June 30, 1877 Silver City Herald reported: “We regret to announce that the Rev. Mr. Greene will leave us in the early part of the week. Mr. Greene was the recipient of a purse of \$125 from citizens who appreciate his disinterested services here in the cause of religion.” After leaving Silver City, Greene relocated to Creswell, Colorado where he stayed until 1879. During this period he continued to collect and study plants in Colorado, but also made forays into New Mexico, Arizona and Mexico. In early 1880 Greene decided to return to Silver City arriving on February 21. The Reverend was listed in the 1880 Silver City census. He stayed in the area for about a year, ministering to his flock and extensively botanizing the Mogollon Mountains, the Piños Altos Range and surrounding areas. He began describing New Mexico plants in John Merle Coulter's *Botanical Gazette* in 1880. In the spring of 1881, Greene undertook a new mission as rector of St. Mark's Episcopal Church in Berkeley, California. He left Silver City in May.

With his arrival in California came changes in his attitudes. He began to drift away from Episcopal doctrine towards Roman Catholicism. By 1883 half his congregation was gone. The Episcopal Bishop told Greene to resign or be fired. Eventually Greene was locked out of the church. A tale remains of Greene flanked by the remaining faithful marching down the street with ax in hand to break down the doors of St. Marks. He resigned his ministry in late 1883 and in 1884 became a lay Roman Catholic. Virtually coincident with this religious change, Greene began to develop a more adversarial relationship with Gray and other eastern botanists. He began determining plants for western botanists. Parry supplied specimens. Henry Hurd Rusby collected for Greene in the higher Mogollon Mountains. John Gill Lemmon also sent plants to Greene. In September 1882 he began a course of lectures at the University of California. Greene began publishing names for California plants in the *Botanical Gazette* in 1883. He became curator of the herbarium at the California Academy of Sciences. In 1885 Greene was formally appointed as an instructor in botany at the University of California. In the same year he was formally received into the Roman Catholic Church.

Greene had found his niche. By 1891, he had become a full professor. In 1890-91, the university established a separate botany department. Greene was the chair. In 1887 he established the journal *Pittonia* at his own expense. He became established as an authority on taxonomic botany. In 1892, he was one of only three American representatives (with J.M. Coulter and Nathaniel Lord Britton) to the International Committee on Botanical Nomenclature. In 1893 he was elected president of the Botanical Congress in Madison, Wisconsin. In 1894, he received an honorary LL.D. from the University of Notre Dame. With Greene, however, success would somehow always be accompanied by controversy. His divisions with other botanists widened. He became an aggressive advocate for nomenclatural reform. He became embroiled in procedural and philosophical issues with the president of the University. Thus, in 1894, Greene accepted a professorship in botany at the Catholic University in Washington, D.C.

There, he continued his pursuit of new rules for botanical nomenclature and to produce publications, over 175 during his tenure at the University. He had only a small number of students. The School of Biological Sciences consisted of a single person, Edward Lee Greene, Professor of Botany. The school was mired in financial problems and administrative disarray. It was inevitable that Greene would become entangled with the problems of the administration and trustees in defense of his tiny department. In November 1903 he informed the administration that he was resigning effective September 1904. He had carried his vast library of over 4000 volumes and his extremely valuable herbarium with him from California. These were transferred to the Smithsonian Institution under an agreement to leave them for ten years. Greene became an unsalaried associate and was granted working space.

At this point, Greene's emphasis shifted from taxonomy and systematics to the history of botany. His work was supported by a grant of fifty dollars a month from the Smithsonian, curiously about the same amount he was able to earn in his first Illinois rural teaching jobs. Greene's theological training and his own profound interest in languages gave him good fluency in Greek and Latin, but he also was quite literate in German, Italian, and Norwegian among others. This linguistic facility allowed him to work from original sources at the Smithsonian and in the Surgeon General's Office. By 1907, the first volume of his projected multivolume study was completed, which was published in 1909 as *Landmarks of Botanical History, Part I*. Work on the second part occupied the remainder of Greene's tenure at the Smithsonian, but it was never completed. He produced a handwritten copy of the work in progress. A typewritten copy was produced by the Smithsonian in 1936. The work was first published in 1983. These two volumes are recognized as a significant contribution to the early history of botany in the period from Theophrastus of Eresus to the seventeenth century.

Greene began to wonder about his future even early on at the Smithsonian. In 1907 he was in contact with an ex-student from the Catholic University who had become Professor of Botany at the University of Notre Dame in South Bend Indiana. Greene expressed interest in moving there. He began visiting the school in 1909. In 1912, he contacted the President offering to bring his library and herbarium to Notre Dame if provided living quarters and a small annuity. By late 1914, all arrangements were complete and Greene's agreement with the Smithsonian had expired. He arrived with

books and plants in South Bend in the spring of 1915. In October he returned to Washington intending to work on his history of botany. He fell ill. When his condition worsened, he entered Providence Hospital, where he died on November 10, 1915.

## A Perspective

Contentions that Greene strongly influenced the course of botany in the United States, that he had a powerful effect on botanical nomenclature, that he was a prodigious collector and describer of plants, that he was an important contributor to the emergence of a western school of botany in the U. S., are indisputable. Assertions that he refused the judgments of others, that he was quick to dismiss and sarcastically decry the work of peers, that he felt his capabilities of observation were superior to those of other botanists, and that he did not work smoothly with others, are hardly deniable. Few could provoke the wrath of enemies as effectively as Greene. In a letter to Gray December 3, 1887, Coulter states: "What in the world is going to become of us with Greene stirring up synonymy with a pitchfork? His *Pittonia* No. 2 wh[ich] you review ... is bad enough; but has *Pittonia* No. 3 come to your hands? It reads like the work of a crazy man, at least one lost to all sense of propriety. Is he not a second Rafinesque?" In a letter to Sereno Watson on June 12, 1890, Coulter (discussing Greene) continues: "If he could only quietly pass away in one of his apoplectic fits, how much better for American botany!" One of Greene's most acerbic foes, Marcus E. Jones, on Greene's death wrote: "Greene, the pest of systematic botany, has gone and relieved us from his botanical drivel. They say that the good that men do lives after them, but the evil is interred with their bones. I suspect that his grave must have been a big one to hold it all."

Greene was not without friends and supporters. C. C. Parry was a lifetime friend and correspondent. Greene's most famous student Willis Linn Jepson and others in the emerging California botanical community agreed with many of Greene's positions. Michael Schenk Bebb and N.L. Britton were also supporters.

During his time in the west before his move to Washington D. C., Greene was a dedicated field botanist. His physical stature and fitness gave him the ability to cover great distances. He commonly walked fifty miles in a day. He felt that a true understanding of plants could only be gained in the field and that "closet" botanists could not possibly understand the subtle differences between plants observed while alive. Although well trained in standard botanical methods, he certainly applied his own techniques. He even used smell as a criterion and in one case "indescribable grace" to differentiate species.

His religious fervor gave him a tendency to believe in the fixity of species. He did not formally reject evolution, nor did he study the subject or its implications. Greene gained the reputation of being a splitter, naming numerous new species. The tradition that all plants needed to be sent to Cambridge for determination produced resentment in Greene (and others in the west). He sent plants to Gray but came to disagree with some of his conclusions. As Joseph Ewan puts it: "Perhaps as much as anything a lack of comprehensive knowledge of evolutionary theory and a consequent inability to evaluate plant variations as others did, accounted for most of the differences between Gray and

Greene.” Greene was joined by Albert Kellogg and other Californian botanists in the belief that Californian plants should be examined, classified, and published by resident scholars, but eastern botanists were uncertain about the proliferation of new plants.

At the same time, while Greene was in his botanical prime, he began to develop strong feelings that the rules of botanical nomenclature were inconsistent and deeply in need of change. He was an absolute believer in priority, which motivated him to collect ancient sources and to become an ardent student of botanical history. He felt that the practice of initiating priority with the arrival of Linnaean binomials was wholly arbitrary, advocating consideration of Greek, Roman, and medieval authors. In his 1894 *Manual of the Botany of San Francisco Bay*, he chose some generic names attributed to some pre-Linnaean authors. Greene also strongly objected to the “Kew Rule,” which allowed a taxonomist upon transferring a plant to a new genus to ignore the previous species epithet. N. L. Britton, at the nascent New York Botanical Garden, held similar convictions, leading a faction in the east advocating strict adherence to priority and against the taxonomy of Gray, Hooker, and Bentham. The efforts of Greene and Britton eventually led to the controversial Rochester Code of 1892.

Before Greene left California his botany was at its height. After arriving in Washington D.C., he himself became a “closet” botanist and the quality of his work diminished. In the words of Rogers McVaugh: “...like many others before him he began to see species in the herbarium his contemporaries could not see in nature.” In 1983 McVaugh did a study of Greene’s taxonomic pronouncements. During his California period Greene created an average of about 90 new specific names per year. In Washington D.C. Greene’s yearly production was more than double that in California. Greene proposed a total of about 3000 new specific names. McVaugh prepared a detailed analysis of Greene’s California work based on the *Bulletin of the Torrey Botanical Club* from 1881 to 1886 and the *Bulletin of the California Academy of Sciences* (1885 – 86). McVaugh shows about 300 new names, 242 for new species. About two-thirds are Californian. The results are summarized in the following table from *Landmarks of Botanical History, Part I*, p. 60:

Source	Currently accepted unchanged	Accepted in another genus	Accepted as variety or subspecies	Doubtful	Synonyms	Total	Percent of valid taxa
California	60	24	26	5	44	159	69%
Baja CA	14	6	6	6	7	39	70%
New Mexico	12	–	–	–	6	18	67%
Arizona	7	1	1	–	4	13	70%
Various	6	–	3	–	4	13	70%
New combs	14	33	4	4	6	61	–

Greene’s percentages of valid taxa are quite respectable for this period.

An interesting parallel occurs in Paul Carpenter Standley’s *The Type Localities of Plants First Described from New Mexico* (1910). Standley lists type localities, collectors,

and authors for 714 species. Greene collected 52 species and described a total of 171 (second only to Asa Gray with 173). Standley's data is summarized in the table below:

	Accepted	New genus	Varietal status	Subspecies status	Synonym	Total
1895 or before	19	5	1	–	16	41
After 1895	22	6	11	2	89	130

Of the 41 species described by Greene in or before 1895, 25 (61%) are valid taxa using McVaugh's standards. Of the 41, 34 were collected by Greene. Of the 130 species described after 1895, only 41 (31.5%) remain valid. While the number of New Mexico's species Greene described more than tripled, the quality of his botany deteriorated after his arrival in Washington D.C.

A more general picture of Greene's impact on New Mexico's botany is gained by analysis of *The Working Index of New Mexico Vascular Plant Names*. Greene appears as author on 401 species, spanning 163 genera in 48 families. Their taxonomic status is illustrated in the table below. Generic revisions by Greene are not considered.

#### Taxonomic Status of Greene's Species

Accepted	New genus	Varietal status	Subspecies status	Synonym	Other
81	29	46	8	234	3

Again, using McVaugh's standards for valid taxa, 167 remain valid (41.6 %.) This percentage seems a fair reflection of Greene's place in botany, somewhere between the powerful work of his California days and his decline after moving east in 1895. *The Working Index* also gives other impressions of Greene's New Mexico work. He proposed ten species in his *Schmaltzia* (now *Rhus trilobata*), seven are reduced to synonymy. Greene named one quarter of the state's Senecios. He did no treatment of ferns, pines, junipers, ephedras, evening primroses or willows. He did not describe a single species in Cactaceae, Chenopodiaceae, Cyperaceae, Juncaceae or Poaceae.

Greene's contribution will probably be debated for many years, and he will certainly not be forgotten. His disputes with the established practices and personalities of botany produced change as well as controversy. Possibly the best assessment of Greene is given by Charles E. Bessey in a letter to Greene on March 2, 1910: "I have a great leaning towards any man who has something of heresy in him. . . You have dared to be original and that is what pleases me immensely."

## References

- Allred, Kelly W. 2004. *A Working Index of New Mexico Vascular Plant Names*. Range Science Herbarium. New Mexico State University.
- Dupree, A. Hunter. 1959. *Asa Gray*. Harvard University Press.
- Ewan, Joseph. 1950. *Rocky Mountain Naturalists*. University of Denver Press.
- Greene, Edward Lee and Frank N. Egerton, Editor. 1983. *Landmarks of Botanical History*, Part I. Stanford University Press.
- Greene, Edward Lee and Frank N. Egerton, Editor. 1983. *Landmarks of Botanical History*, Part II. Stanford University Press.
- Greene, Edward Lee. 1878. *Rambles of a Botanist in New Mexico*. The American Naturalist. March 1878
- Humphrey, Harry Baker. 1961. *Makers of North American Botany*. The Ronald Press Company.
- Martin, William C. and Charles R. Hutchins. 1980. *A Flora of New Mexico*, Vol. 1 – 2. A.R. Gantner Verlag K. G. (J. Cramer).
- Rodgers, Andrew Denny III. 1944 *American Botany 1873 – 1892: Decades of Transition*. Princeton University Press.
- Rodgers, Andrew Denny III. 1944. *John Merle Coulter: Missionary in Science*. Princeton University Press.
- Standley, Paul Carpenter. 1910. *The Type Localities of Plants First Described from New Mexico*. Contr. U.S. Natl. Herb. 13: 143 – 246.
- Wooton, E.O. and Paul C. Standley. 1972. *Reprints of U.S. Floras, Flora of New Mexico*. Wheldon & Wesley, Ltd. Stechert-Hafuer Agency, Inc.