

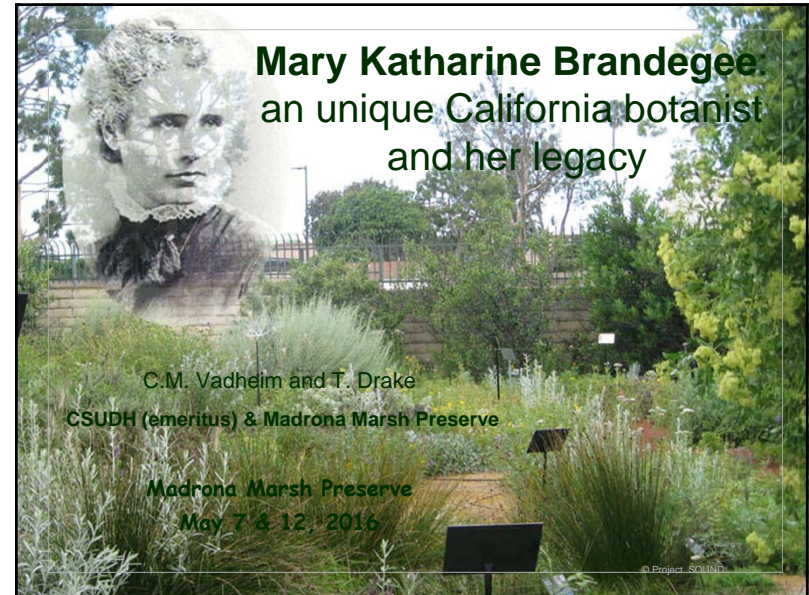
Out of the Wilds and Into Your Garden



Gardening with California Native Plants in Western L.A. County
Project SOUND – 2016 (our 12th year)

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Mary Katharine Brandegee, an unique California botanist and her legacy



C.M. Vadheim and T. Drake
CSUDH (emeritus) & Madrona Marsh Preserve

Madrona Marsh Preserve
May 7 & 12, 2016

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2016 Season - Rediscovering Eden: S. California Gardens for the 21st Century



Search Writings
Larchsblog.com

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Mary Katharine Layne Curran Brandegee



- Who she was
- What she did
- What her story tells us about the times in which she lived & worked
- Why she and her work are important today

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Important CA plantspersons we have 'met'

- Katharine Brandegee (1844-1920)
- Kate Sessions (1857-1940)
- Alice Eastwood (1859-1951)
- Blanche Trask (1865-1916)
- Theodore Payne (1872-1963)
- Lester Rountree (1879 -1979)

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Only one 'book' on Townshend Stith and Mary Katharine Layne Curran Brandegee



Title	<i>Townshend Stith Brandegee and Mary Katharine Layne Curran Brandegee, William Albert Setchell Volume 13, Issue 9 of University of California publications in botany</i>
Author	William Albert Setchell
Publisher	University of California Press, 1926
Length	1 pages

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<http://www.myfolsom.com/resident-guide/folsom-history/prairie-city/>

The early years

- Born 1844 in western TN
- Second of 10 children; life wasn't always easy; father drifted from one thing to another
- 'My father, an impractical genius, afflicted with *Wanderlust*, moved continually till stopped by the Pacific Ocean, which we reached before my ninth year'
- Finally settled on farm near Folsom, CA



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To put the times in historical perspective

- Folsom was a Sacramento Valley mining town - things were quite primitive when the family got there in the 1850's
- The railroads had just connected Folsom with the rest of the country
- The Civil War was right around the corner
- Unfortunately, very little is known about her schooling
 - Probably erratic
 - ? Seminary at Folsom



<http://www.myfolsom.com/resident-guide/folsom-history/folsom-historical-photos/>

© Project SOUND

Young adulthood: much is lost to history



- ? Taught school in Folsom area - probably for several years before she married
- 1866 - married Hugh Curran (a local constable);
 - He was an alcoholic and ultimately died young.
 - Mary Katherine supported him and nursed him
- 1874 - widowed

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Brandegge - Woman of the West



<http://www.myfolsom.com/resident-guide/folsom-history/folsom-historical-online/>



<http://insuremekevin.com/folsom-to-roseville-california-central-railroad/>

- Grew up in the 'wild West' atmosphere of Gold Rush Folsom (1850's and 60's)
- Was an elder daughter on her father's farm - and CA farms of the day were rough & ready sorts of places
- Developed into a robust woman who was physically strong and had no trouble speaking her mind, organizing and leading others
- She was also one smart cookie!

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Medicine was a tough career in the 1870's



<http://fineartamerica.com/featured/1800s-medical-school-paul-schby-antique-image.html>

- 1875 - entered UC Medical School (San Francisco) - 3rd woman
- 1878 - M.D. degree
- Opened an office but didn't get many patients - in her spare time she did what many women of her time did - **volunteered**

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But her volunteer work was a little different....



<http://www.kaskus.co.id/thread/52e39fd17cb17a1408b468e/mari-membuat-herbarium/>

... she'd found her life's passion during medical school – and it wasn't medicine

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Parallels in the lives of notable CA plantspersons

	Theodore Payne	Lester Rowntree	Alice Eastwood	M.K. Curran Brandegee
Lost a parent early	X		X	
Difficult childhood; jobs, other household responsibilities	+/-	+/-	X	X
Boarding school/time away from family	X	+/-	X	
Move to CA at impressionable age	X	X	X	X
Financial difficulties	X	X	X	X
College education				X
Unconventional; self-motivated	X	X	X	X
Unmarried for much of life		X	X	+/-
Early love of plants fostered by significant adults	X	+/-	X	+/-

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Dr. Curran was introduced to the study of plants in medical school



<http://www.homeopathy.at/complete-materia-medica-mind/>



<http://www.facsimilefinder.com/facsimiles/herbolariu-m-el-materia-medica-facsimile>

The study of *Materia Medica* – plant based medicine – formed an important part of the pharmacology training of physicians in the 1870's

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Dr. Hans Herman Behr



https://en.wikipedia.org/wiki/Hans_Hermann_Behr

- 1818-1904
- Born and educated in Germany; prominent family
- M.D. in 1843
- From boyhood interested in natural history - birds, insects & plants
- 1846 & 1848 - trips to Australia to study/collect insects, plants; 1948-9 - first person to systematically study the flora of many parts of South Australia
- 1850 - moved to San Francisco; continued to collect insects, plants and to publish
- In part responsible for early introduction of Australian plants to CA

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Dr. H. Herman Behr: eminent faculty member



<http://www.calacademy.org/scientists/entomology-collection>

- 1872 - CA Pharmaceutical Society formed; Behr appointed professor of botany; he also was on the medical faculty at UC
- Required to organize field trips "into the country on alternate weeks for the purpose of collecting and studying indigenous plants."
- 1854 - member of new CA Academy of Sciences (CAS)
- 1895 - elected Vice President, CAS; 1898 - Curator of Entomology
- Donated his large collection of Lepidoptera to the Academy but it was destroyed in the earthquake of 1906.

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Dr. Behr was an evolutionary taxonomist



<http://ucjeps.berkeley.edu/archon/?p=digital-library/digitalcontent&id=14>

- Authored a number of books including:
 - *The Plants of the Vicinity of San Francisco*
 - 1884 - *Synopsis of the genera of vascular plants in the vicinity of San Francisco, with an attempt to arrange them according to evolutionary principles*
 - 1891 and 1896, Behr published two essays entitled *Botanical Reminiscences* in which he describes the **changes in the vegetation of San Francisco from 1850.**
- "In looking from any stand-point, at the variety of organic forms, the theory of evolution will be the most successful in explaining the resemblances and differences of organized life."

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Dr. Behr was a leading light in the new California Academy of Sciences



<http://ucjeps.berkeley.edu/archon/?p=digital-library/digitalcontent&id=14>

- Dr. Behr was a kindly, helpful mentor to many students and younger CAS members
- It was he who introduced Dr. Curran to many members of CAS, and was instrumental in getting to do needed volunteer work in the herbarium.
- 1879 - Dr. Curran admitted to CA Academy of Sciences
- 1879-1883 - volunteer work in the herbarium & collecting in the field, primarily in San Francisco area; Dr. Behr & others responsible for further training

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Dr. Behr was a distinguished CAS member



The field trips, the joy of discovery and the dedication to scientific rigor all greatly influenced Katherine Curran

Perhaps his outspoken nature can also be seen in his pupil

'Surely none who had the good fortune to go with him on these excursions will ever forget the genial old man, always witty, humorous, and ready to teach, and his almost childlike pleasure when he found a rare plant or insect.'

But he was the 'sworn enemy of all scientific humbug, of quacks and false pretenders... he never refrained from expressing his opinion of them, quite regardless of person or station.'

Report of the Committee Appointed to Prepare and Present an Account of the Life and Services of Dr. Hans Herman Behr - presented to CAS March 21, 1904

<https://archive.org/details/doctorhansherman00call>

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California Academy of Sciences



<http://www.calacademy.org/understanding-evolution/>

Museum around 1900

- Founded 1853 - three years after CA statehood - founders propose to undertake "a thorough systematic survey of every portion of the State and the collection of a cabinet of her rare and rich productions."
- 1853 - vote to include women
- 1860 - first geologic survey
- 1873 - first museum opens
- 1891 - grand new museum in downtown San Francisco
- 1896 - closer relations, University scientists
- 1903 - first major conservation expedition

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Dr. Curran joined Academy at an interesting time



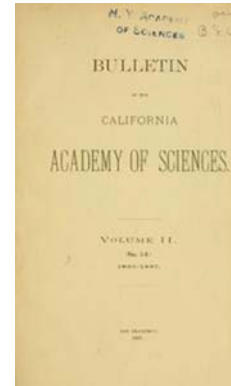
Herbarium in 1893

- Before 1883, curatorship of the Botany Dept. was yearly, voluntary position
- In 1883, Dr. Curran became the curator of the Herbarium
- At that time, President Harvey Harkness wrote the "Our herbarium was nearly destroyed by insects and almost useless for lack of classification. Many of our valuable books...had been stolen from us. Our publications having ceased in 1878, our exchanges...had greatly diminished and were dwindling daily."

One Hundred and Fifty Years of Botany at the California Academy of Sciences (1853-2003)

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One of Dr. Curran's first scientific tasks was to review & publish previously 'presented' taxonomic work



- The custom of the CAS was to 'present' scientific findings orally at CAS meetings.
- The results were then published in the (occasionally published) Proceedings of the CA Acad. of Sciences or in other publications (including newspapers)
- In 1883, Curran founded & edited a new journal, the *Bulletin of the California Academy of Sciences*
- The goal - largely met - was to publish scientific findings in a timely manner, in a local, respected journal

© Project SOUND

The 1883-1896 were busy times at the CAS herbarium



<http://blogs.nybg.org/science-talk/2014/02/katherine-brandegee-blazing-a-trail-for-women-in-science/>

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- The herbarium was the center of botanical research and knowledge in western U.S.
- Dr. Curran was one of only two employed women botanists in the U.S.
- Dr. Curran's duties included:
 - Fieldwork - increased herbarium holdings
 - Organizing the herbarium
 - Classifying a huge backlog of herbarium samples
 - Acting as editor of a new journal(s)
 - Public outreach - including forming and managing the California Botanical Club

Joint Curatorships of Botany at CAS

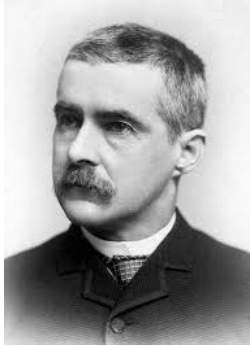


A

- Curran & Justin P. Moore : 1883
- Curran & Edward L. Greene : 1884-1887.
- Curran and Hasbrouck Davis: 1888-1889
- Curran & Volney Rattan: 1890
- Curran & Alice Eastwood: 1891-1894

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In 1886, Dr. Curran met the love of her life –
Townsend Stith Brandegee (plant collector)



- Trained as a civil engineer, but a plant collector at heart
- Worked as surveyor and plant collector on Hayden Survey & other surveys
- Loved the out of doors
- By all accounts was a wonderful, intelligent, self-effacing gentleman
- And he and Dr. Curran fell madly in love - and stayed so until she died in 1920

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New beginnings: late 1880's and early 1890's



- 'Acting Editor' of the *Bulletin of the CA Acad of Sci*
- Met Townsend Stith Brandegee (civil engineer and avid plant collector)
- 1889 - Married in San Diego; walked to San Francisco, botanizing as they went, for their honeymoon
- 1890 - with Dr. Harkness and TS, founded *Zoe* (TS was editor)
- 1891 - organized the 'California Botanical Club' (A. Eastwood usually gets the credit)
- Continued collecting - all over CA & Baja - alone & with T.S

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The Brandegee's marriage was truly a
'marriage of hearts & minds'



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The San Diego years: 1894-1906



- 1894 collecting trips to the Tehachapis, Mojave & Lake County, in addition to parts of Baja CA
- Moved to San Diego to be nearer to Baja & S. CA - where their research focus now was

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The San Diego years: 1894-1906



- Bought land on 'Banker's Hill', overlooking the ocean in San Diego
- Built a botanic garden, greenhouse, library and herbarium (the first for San Diego)
- Lived in a tent until the house was built (after the herbarium)



For a decade, the Brandegee herbarium/garden was a botanic hub



- A place where visiting scientists came
- A repository for rare S. CA and Mexican plants (both living and pressed)



<http://ucjeps.berkeley.edu/archon/?p=digitallibrary/request&id=1&fileid=1&referer=ucjeps.berkeley.edu/%2Farchon%2F%3Fp%3Ddigitallibrary%2Fdigitalcontent%26id%3D1>

<http://ucjeps.berkeley.edu/archon/?p=digitallibrary/digitalcontent&id=11>

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It was also a workplace and a refuge



- A workplace, where serious taxonomic work was conducted
- A laboratory, where plants could be grown, hybridized and studied over time and under controlled conditions



<http://ucjeps.berkeley.edu/archon/?p=digitallibrary/request&id=1&fileid=1&referer=ucjeps.berkeley.edu/%2Farchon%2F%3Fp%3Ddigitallibrary%2Fdigitalcontent%26id%3D1>

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The Brandegees move to Berkeley in 1906



- Life in San Diego was too distant from academic life - and the work involved in the garden/herbarium was taking its toll
- The herbarium & library were 'donated/sold' to the UC Herbarium (Berkeley)
 - Over 100,000 samples
 - Doubled the UC [now Jepson] herbarium holdings
- 1906 - TS takes an 'honorary' position as curator of the UC Herbarium

<http://ucjeps.berkeley.edu/archon/?p=digitallibrary/digitalcontent&id=11>

© Project SOUND

Later years: 1906-1920's



<http://ucjeps.berkeley.edu/archon/?p=digitallibrary/digitalcontent&id=11>

- 1906-1920 -
 - Both TS and Katherine volunteer at herbarium
 - Continue collecting trips in CA and NV
- 1910 on - Katherine's diabetes becomes more debilitating
- 1913 - Katherine makes extensive trip of Eastern herbaria to research type specimens
- 1920 - died in Berkeley of 'senility' and nephritis (age 75)
- 1925 - T.S. dies

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What lessons can we learn from Mary Katharine Layne Curran Brandegee?



<http://ucjeps.berkeley.edu/archon/?p=digitallibrary/digitalcontent&id=11>

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Katherine Brandegee played a pivotal role in moving the balance of Western botany from the East to the West (California)

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Plant taxonomy in the 1880's



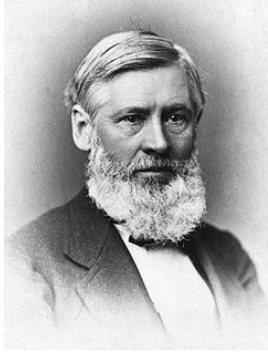
http://botlib.huh.harvard.edu/libraries/Gray_Bicent/grayherbarium.htm

Sereno Watson

- Dominated by Europe and a few centers in the U.S. (Harvard; Yale)
- Little formal training available - and most in the West (including the CAS) were amateurs (often M.D.s or clergymen)
- 'Plant collectors' would send specimens to the academic botany centers for evaluation
- The 'plant scientists' did the taxonomy - including naming a ton of plants that bear their attribution today

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Dr. Asa Gray – 1810-1888



https://en.wikipedia.org/wiki/Asa_Gray

- Considered the most important American botanist of the 19th century
- M.D. degree but didn't practice - enjoyed botany more!
- Harvard University's botany professor for several decades; founded the Gray Herbarium at Harvard
- Instrumental in unifying the taxonomic knowledge of the plants of North America
- An ardent Darwinist

© Project SOUND

The Gray Herbarium



<https://oneidacountyhistory.wordpress.com/tag/asa-gray/>

© Project SOUND

- Considered 'seat of American botanic knowledge' in the 1860-80's
- 'Collectors' from around the U.S. sent their samples to the herbarium for evaluation
- As the West developed it's own botanic experts, this arrangement began to grate on some, including Albert Kellogg, A.E. Greene & Katherine Curran (all from the CA Acad. of Science)

Rebellion of Western botanists

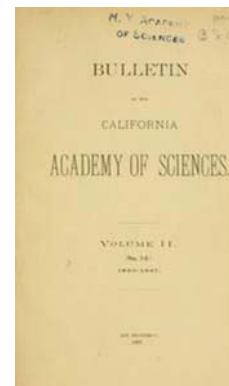


<https://www.harvard.edu/asa-gray.htm>

- Dependence riled some active collectors - why should Easterners get all the credit?
- Some of the better Western taxonomists didn't believe that the Easterner's understood Western plants
- Some felt that seeing plants in the field was key to their taxonomy
- Some (not Curran/Brandege) also disagreed with the evolutionary outlook of the Easterners

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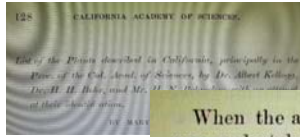
The 'botanists' of the CAS had high aspirations – but needed a bit of refinement



- Needed more academically trained plant scientists
- Needed to 'clean up their act' regarding a few important aspects of taxonomy:
 - **Writing up clear descriptions** of the specimens (particularly those proposed as new species)
 - **Publishing their descriptions in reputable scientific journals**
 - **Publishing in a timely manner** so the Easterners wouldn't 'scoop' them
 - **Applying the scientific method** - including the framework provided by the theory of evolution

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An early Curran article was dedicated to making some sense of the previously presented CAS botany papers



When the arrangement of the Herbarium of the Academy was undertaken two years ago, the necessity of bringing these scattered descriptions of species together in some form, soon became apparent; but the press of other necessary labor prevented the undertaking until this winter.

The preparation of this list has been a matter of more difficulty than would be supposed, on account of the scattered and fragmentary condition of the material.

The types of many of the species have disappeared from the herbarium, and many have been identified from drawings by Dr. Kellogg, which have only recently become accessible to us. In the labor of identification, the writer has received the constant advice and assistance of the Rev. E. L. Greene.

Turning the CAS herbarium into a true scientific repository was equally important



- Collecting samples of CA plants and animals was to important in the early days
- But equally important was the careful description, cataloging and classification
- While Alice Eastwood was instumental in this, Dr. Curran was a key figure in **creating a true CAS herbarium**

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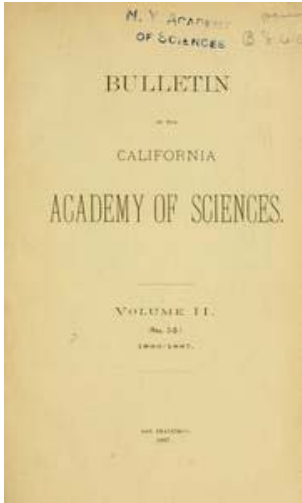
The late 19th century was a difficult time to be a woman scientist

The Victorian Era: some freedoms



<http://www.angelpig.net/victorian/teatime.html>

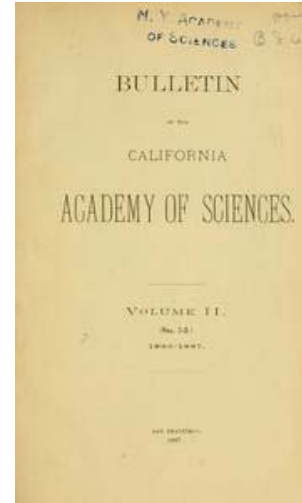
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CA journals important for plant taxonomy

- Bulletin of the California Academy of Sciences
- One of the first mainstream 'scientific' journals to be published in the Western U.S
- San Francisco: 1883-1897 (succeeded by Proceedings of the California Academy of Sciences, 3rd ser., Botany [1897-1907] and Proceedings of the California Academy of Sciences, 4th series [1907-present])

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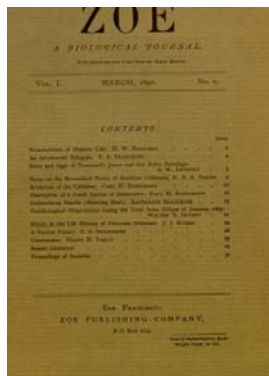


Bulletin of the California Academy of Sciences

- Started by M.K. Curran in 1883
- Curran oversaw all aspects of editing and publishing - she literally *was* the Bulletin
- But because the Bulletin needed to be viewed as a 'respectable' scientific journal (and garner subscriptions):
 - Curran was listed only as 'Acting Editor'
 - Some of her writings were not 'signed'

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Zoe: Katherine Brandegees's journal



- Description: a 'medium for recording in accessible form the numerous, often unconnected observations, pertaining more particularly to the western part of North America, made by amateurs as well as working naturalists...'
- Published 1891-1906; various 'editors' to hide Brandegees's role
- Served as another Western outlet for scientific papers - some seminal
- Most of Brandegees's total published works were published in Zoe, including some interesting editorial and theoretical writings

<http://earlywomeninascience.biodiversityexhibition.com/enbook/zoea-biological-journal>

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The ability to write clear, accurate scientific descriptions of plants **requires intimate knowledge of them**

Fortunately Curran was an excellent editor and clear writer



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Eriogonum giganteum



Gary A. Monroe © USDA-NRCS PLANTS Database

- *ssp. formosum*: San Clemente Island
 - variety named by K. Brandegee; collected by T.S. Brandegee
 - *Eriogonum giganteum* subsp. *formosum* (K. Brandegee) P. H. Raven
- *ssp. giganteum*: Santa Catalina Island
 - this is the well-known 'St. Catherine's Lace' of garden fame
- Both subspecies:
 - Rocky cliffs, slopes, and ridges, coastal scrub communities, oak woodlands
 - Rare: species of conservation concern

© Project SOUND

Description by K Brandegee: *Erythea*, v. 5

- *var. giganteum*
 - 'On Catalina Island this often forms a shrub 6 to 10 feet high, with a trunk 3 to 5 inches in diameter, the branches near the top. *This arborescent form, if not entirely caused, is undoubtedly much assisted, by the sheep gnawing away at the lower branches.*
 - Good specimens in late flower and fruit were collected in 1886 by A.W. Anthony (No. 115), and young plants are growing in our botanic garden.'



© Project SOUND

Description by K Brandegee: *Erythea*, v. 5

- *var. formosum*
 - 'Branching from the base, rarely arborescent; leaves densely white-tomentose on both sides, less so above with age, oblong-lanceolate or oblanceolate, 5 to 8 cm. long, 13 to 20 mm. wide, on stout petioles 2 to 4 cm. long; *cyme larger, looser and more foliaceous than the type; pedicels much longer and exerted*
 - 'Collected on San Clemente Island, by Dr. E.A. Mearns and T.S. Brandegee, Aug., 1994. *Type in the herbarium of T.S. Brandegee, and now growing in our garden, from seeds of type*



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To make a contribution to taxonomy,
don't be afraid to tackle
'challenging' groups of plants

*Calico Monkeyflower – *Mimulus pictus*



© Mark W. Skinner 1992
 Mark W. Skinner © USDA-NRCS PLANTS Database

© Project SOUND

*Calico Monkeyflower – *Mimulus pictus*



http://ucjeps.berkeley.edu/cgi-bin/get JM_treatment.pl?Mimuluspictus

- Southernmost Sierra Nevada and adjacent Tehachapi Mountains in Tulare and Kern Counties
- Bare, sunny areas around shrubs, rock outcrops on granitic soils - elevation 300 - 4200 ft.
- Forest and woodland habitat
- First collection in CA Consortium was MK Curran (Brandegee) - June, 1884, Keene Station, Kern County
- *Eunanus pictus* Curran ex Greene

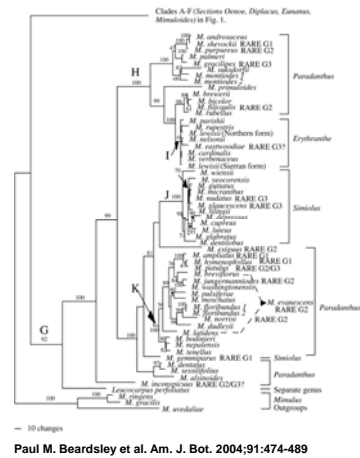
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Fig. 1.



Paul M. Beardsley et al. Am. J. Bot. 2004;91:474-489

Fig. 2.



www.amjbot.org

American Journal of Botany

Those troublesome monkeyflowers

- *Eunanus kelloggii* Curran ex Greene -- not accepted
- *Eunanus pictus* Curran ex Greene -- not accepted
- *Mimulus androsaceus* Curran ex Greene -- accepted -- rockjasmine monkeyflower
- *Mimulus kelloggii* (Curran ex Greene) Curran ex A. Gray -- accepted -- Kellogg's monkeyflower
- *Mimulus nudatus* Curran ex Greene -- accepted -- bare monkeyflower
- *Mimulus palmeri* var. *androsaceus* (Curran ex Greene) A. Gray -- not accepted
- *Mimulus pictus* (Curran ex Greene) A. Gray -- accepted -- calico monkeyflower

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To find unusual plants, look in unusual places (note: many of the most common plants had already been collected/named by the 1880's)

In collection and taxonomy, Brandegee wasn't afraid to tackle unusual challenges



© Project SOUND

*Swamp larkspur – *Delphinium uliginosum*



<http://pacificbulbsociety.org/pbswiki/index.php/DelphiniumSpeciesTwo>

© Project SOUND

*Swamp larkspur – *Delphinium uliginosum*



http://ucjeps.berkeley.edu/cgi-bin/get_cpn.pl?DEUL



<http://www.esapubs.org/archive/ecol/E087165/appendix-A.htm>

© Project SOUND

- Endemic to **very localized, serpentine soils** in the Inner North Coast Ranges
- **CNPS Rarity: 4.2**
- First described and named by MK Curran [Bulletin of the California Academy of Sciences 1:151 (1885)]
- Curran collected in 1884; 1911



<http://www.ucnrs.org/reserves/mclaughlin-natural-reserve.html>

Bog larkspur: some unique characteristics recognized by M.K. Brandegee

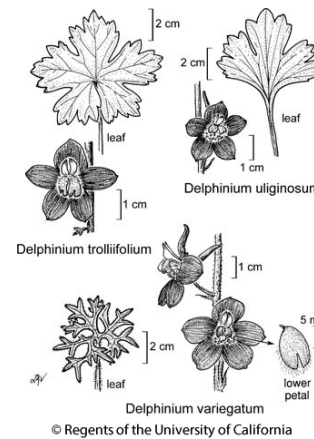


© Br. Alfred Brousseau, Saint Mary's College

- **Size:**
 - 2-3 ft tall
 - 2-3 ft wide, spreading
- **Growth form:**
 - Herbaceous perennial; **all parts of plant are toxic to humans, animals (medicinal)**
 - Drought-deciduous; dies back, fall
- **Foliage:**
 - Medium green; leaves mostly basal
 - Leaf shape unique among larkspurs - fan-shaped (larkspurs usually have palmate leaves with narrow, fingerlike lobes)

© Project SOUND

Brandegee: used morphology and ecology



© Regents of the University of California

http://ucjeps.berkeley.edu/eflora/flora_display.php?fid=22529

- **Differences in morphology (physical characteristics)**
 - Leaf - most obvious is the shape, but also the size and relatively long petiole
 - Flower - some minor differences
- **Differences in where it grew - serpentine bogs (unusual)**
- **Later in life, grew plants in garden so she understood differences in growth; interactions with soil, climate, etc.**

© Project SOUND



©2010 Vernon Smith

Flowers: larkspur blue

- **Blooms:** late spring - usually May-June
- **Flowers:**
 - On tall, wand-like upright stalks, typical of the larkspurs
 - Shape: highly modified petals and long, up-pointing 'spur'
 - Color: deep, iridescent blue-purple - lovely color
 - Pollinators: likely bumblebees, butterflies
- **Seeds:** small, with bumpy seed coat
- **Vegetative reproduction:** spreads

<http://www.arnem.com/spotlight/leya>

© Project SOUND

Plant Requirements



© Sr. Alfred Brousseau, Saint Mary's College

- **Soils:**
 - Texture: ?? Well-drained
 - pH: ? any local
- **Light:**
 - Full sun; probably also afternoon shade
- **Water:**
 - Winter: moist soils
 - Summer: moist soils until flowering complete; slowly dry down after that
- **Fertilizer:** none; likes poor soils
- **Other:** ????

© Project SOUND



<https://truegardentales.wordpress.com/2013/07/24/wyoming-water-impossible-delphinium/>



<https://www.flickr.com/photos/runew/50069898>

Difficult, but worth a try?

- Try in a container first - might be good accent plant
- Seasonally moist areas of the garden, with N. CA grasses, *Mimulus cardinalis*, *Epipactis gigantea* & ferns



<https://www.pinterest.com/pin/252764597809302011/>

© Project SOUND

Perfect for a watered rain garden or bog garden – next month for more



<http://encinitasnatives.blogspot.com/2013/04/bog-planting-in-garden.html>

© Project SOUND

To be a good taxonomist you need to really know the plant, in the field, in the garden and in the herbarium

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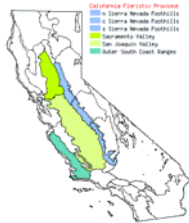
Dr. Curran believed in collecting specimens of a species from multiple locations



©2007 Neal Kramer

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Epilobium cleistogamum (*Boisduvalia cleistogama*) (Curran) P. Hoch & Raven

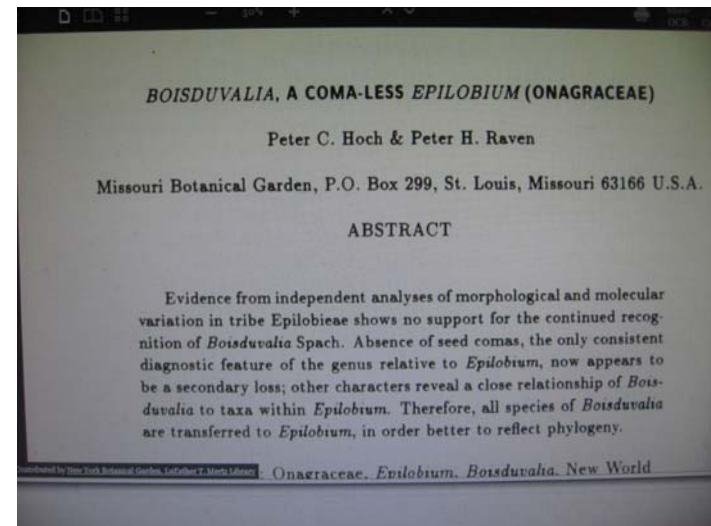


http://ucjeps.berkeley.edu/cgi-bin/new_jmap.pl?00003a2200

Name: *Boisduvalia cleistogama* Curran
Group: Dicot Family: Onagraceae Rank: species
Published In: Bulletin of the California Academy of Sciences 1(1): 12. 1884.

- Curran: May 1883 - Elmira, Solano Co.
- K. C.: Jun 1884 - Antioch, Contra Costa Co.
- M. K. C.: May 1886 - Antioch
- Mary K. Curran: May 1886 - near Antioch
- Katharine Brandegee: Jun 16 1907 - clay depressions between Antioch and Marsh Creek (type locality) - Contra Costa Co.

© Project SOUND

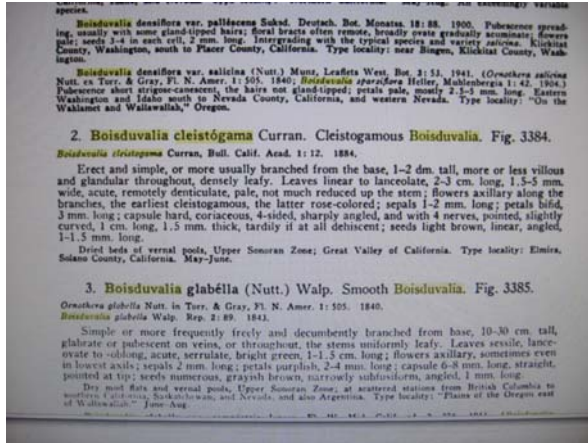


Contributed by Peter Hoch, Botanical Garden, Leinfelden, Stuttgart, Germany

Onagraceae. *Epilobium*. *Boisduvalia*. New World

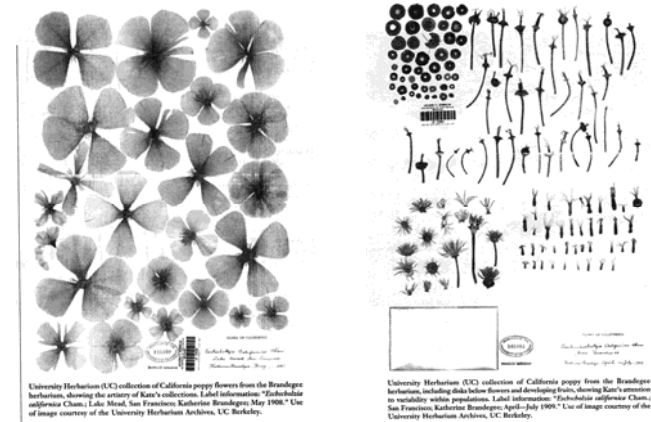
© Project SOUND

Careful descriptions, notes and specimens allow science to progress



© Project SOUND

Meticulous documentation of variability: Example: California poppy



© Project SOUND

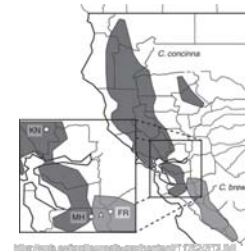
Brewer's Clarkia - *Clarkia breweri*



By Eric in SF - Own work, CC BY-SA 3.0.
<https://commons.wikimedia.org/w/index.php?curid=10393550>

© Project SOUND

Brewer's Clarkia - *Clarkia breweri*



©2014 Chris Winchell

- *Eucharidium breweri* to *C. breweri* (MK Curran notes that E is as good a choice as *Clarkia* in 1889 [*Proc. CA Acad. Sci.*]);
- Collected by MK Curran (1888), Alice Eastwood, Lester Rowntree & many other early botanists
- Threatened by cattle grazing, and potentially by reservoir construction.

© Project SOUND

One of our prettiest native Clarkias



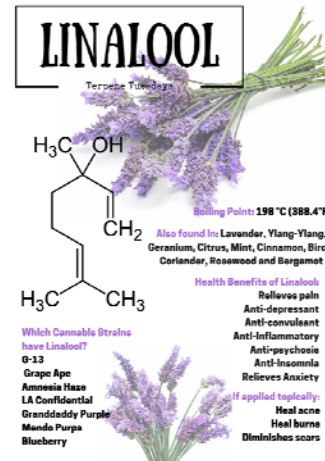
©2010 Neil Kramer

- **Blooms:** spring - usually April-May in S. CA
- **Flowers:**
 - Lavender-pink with white
 - Four petals each have a unique lobe (projection) - different from other Clarkias
 - Overall appearance - square
 - Anthers project out
- **Seeds:**
 - Small, dark seeds in a dry capsule - like other Clarkias
 - Easy to grow from seed

<http://www.anniemerriam.com/topical/bulbs>

© Project SOUND

And the floral scent is...sweet & strong



- Strong, sweet fragrance consisting of 8 to 12 different volatiles - unique combination that may end up as a perfume!
- Scents include the sweetly scented linalool and its pyranoid oxide (in addition to other novel aromatic volatiles)
- Produced at rates 250 times higher than *C. concinna* per unit floral mass
- ?? Medicinal value

© Project SOUND

Annual wildflowers – not demanding



©2005 Keir Morse

- **Soils:**
 - Texture: pretty much any
 - pH: any local
- **Light:**
 - Full sun to part-shade; this one might actually be better with a little afternoon shade
- **Water:**
 - Winter/spring: moist ground through flowering
 - Summer: taper off after flowering ceases
- **Fertilizer:** none; likes poor soils
- **Other:** thin organic mulch (like in nature) is best.

© Project SOUND

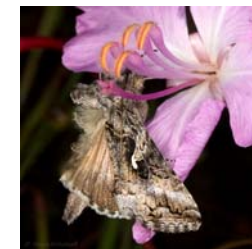
Ooh-la-la touch



©2015 Aarrn Schueleff



http://www.anniemerriam.com/signs/tr%20-%20clarkia_brewer.htm



<http://bugguide.net/node/view/1060910/bpage>

© Project SOUND

In moving science forward, sometimes you need to **come down strongly, even brutally, on the side of rigor**

© Project SOUND

Edward Lee Greene: contentious scientific relationship



- Clergyman-botanist in California
- Became first Botany Professor hired by UC in 1885
- Worked with Curran at CAS in 1880's, 1890's
- Well-known & prolific botanist
- By the end of his career had named over 4,400 new species of plants, published 565 original papers

Was also self-centered, egotistical and sometimes unpleasant

© Project SOUND

Greene was not an evolutionist, and he had some unusual ideas regarding taxonomy and botanic nomenclature



© Project SOUND

Chaparral Bush Poppy — *Dendromecon rigida*



J.S. Peterson © USDA-NRCS PLANTS Database

© 2001 Steven Thomas

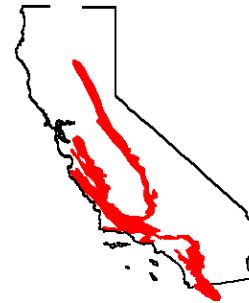


Bush Poppies - great in the garden

- Great accent plant - like a hibiscus
- Good evergreen background plant
- Works well on banks
- Very hardy - fine on parking strips, roadsides, other high-traffic areas
- Bush Poppy probably fine for large planters
- Along south-facing walls
- "Weeping Form" - Weeping Island Bush Poppy

© Project SOUND

Not surprisingly, some variability in a species with range from N. CA to Baja



<https://www.cpp.edu/~jclark/poppy/rig.html>

© Project SOUND

- Benth. - Trans. Royal Hort. Soc., London 1835
- Brandegee collected specimens up & down it's range - concluded a single species
- Greene - 17 species
- Fedde - 20 species
- No wonder that Greene & Brandegee had some rather public disagreements

Dendromecon rigida - synonyms

- Dendromecon agnina **Greene, Pittonia** 5: 299. 1905.
- Dendromecon arborea **Greene, Pittonia** 5: 305. 1905.
- Dendromecon bolanderi Fedde, Repert. Spec. Nov. Regni Veg. 3: 245. 1907.
- Dendromecon brandegeei Fedde, Repert. Spec. Nov. Regni Veg. 3: 246. 1907.
- Dendromecon caesia **Greene, Pittonia** 5: 303. 1905.
- Dendromecon caudata **Greene, Pittonia** 5: 303. 1905.
- Dendromecon densifolia **Greene, Pittonia** 5: 304. 1905.
- Dendromecon elliptica **Greene, Pittonia** 5: 300. 1905.
- Dendromecon fastigiata **Greene, Pittonia** 5: 298. 1905.
- Dendromecon flexilis **Greene, Bull. Torrey Bot. Club** 13: 216. 1886.
- Dendromecon herbacea **Greene, Pittonia** 5: 303. 1905
- Dendromecon leiophylla **Greene, Pittonia** 5: 302. 1905.
- Dendromecon myrtifolia Fedde, Repert. Spec. Nov. Regni Veg. 3: 245. 1907.
- Dendromecon pallida **Greene, Pittonia** 5: 301. 1905.
- Dendromecon pumila **Greene, Pittonia** 5: 301. 1905.
- Dendromecon piercei M.E.Jones, Contr. W. Bot. no. 15: 148. 1929.
- Dendromecon quercetorum **Greene, Pittonia** 5: 301. 1905.
- Dendromecon saligna **Greene, Pittonia** 5: 300. 1905.

© Project SOUND

Greene's taxonomic methods were capricious and unscientific

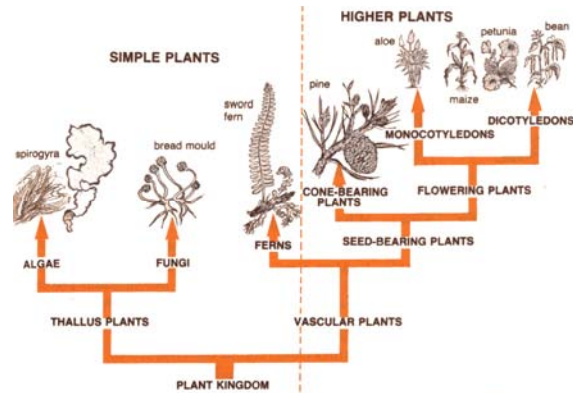


https://en.wikipedia.org/wiki/History_of_botany

© Project SOUND

- Go out and collect as many samples of different plants as possible
- Lay them out on a table
- Those that 'seemed (to him) to be unique' were described as separate species
- Those that 'didn't fit' were tossed in the trash

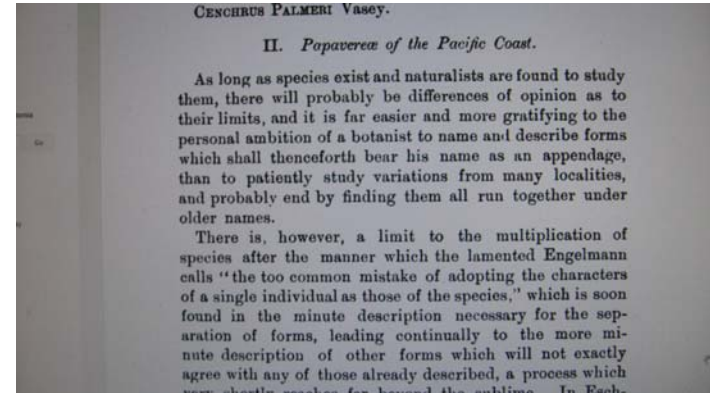
To a person dedicated to finding relationships, Greene's methods were an anathema



http://www.shorelabdiscoverycenter.org/Life_in_a_Pond_Plants.htm

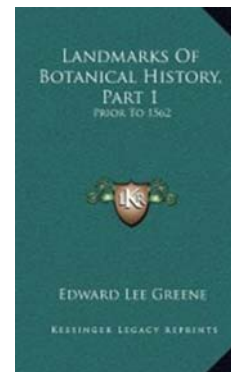
© Project SOUND

Curran was the editor, and she spoke her mind when the science wasn't up to her rigorous standards



To become well known, you need a brand, and you need to promote it

E.L. Greene was a master of self-promotion



<https://www.amazon.com/Edward-Lee-Greene/dp/0806300000>



He's remembered as an 'important California botanist'

He schmoozed, he gave talks, he published – and it paid off

© Project SOUND

Contrast this with Katherine Brandegee



- Intelligent
- Outspoken
- Unconventional
- Little interest in publicity and honors
- Little interest in clothing, housework and other 'feminine' pursuits
- Put science before politics every time

© Project SOUND

Finding her in herbarium collections

- Dr. Curran
- Dr. M.K. Curran
- K. Curran
- Kate Curran
- Katherine Curran
- M.K. Curran
- Mary K. Curran
- Mary Katherine Curran
- Mrs. Curran
- Mrs. K. Curran
- Mrs. M.K. Curran
- K. Brandegee
- K.C. Brandegee
- Katherine Brandegee
- M.K. Brandegee
- Mary Katherine (Mrs.) Brandegee
- Mrs. Brandegee
- Mrs. K. Brandegee

© Project SOUND

Making a significant contribution (to anything) requires **dedication and hard work**

© Project SOUND

Santa Rosa Island/Brandegee's Sage *Salvia brandegeei*



© Project SOUND

Santa Rosa Island/Brandegee's Sage - *Salvia brandegeei*



http://cagps Berkeley.edu/cgi-bin/cgi_bin.pl?document=274745_4065_4068



<http://www.gardens.com/brandegeei.html>

- Grows in two places:
 - N. channel Islands
 - Coastal Islands off N. Baja
- Grows in dry places in coastal sage scrub, chaparral
- Listed: CNPS rare/endangered (over-grazing)

© Project SOUND

Santa Rosa Island/Brandegee's Sage *Salvia brandegeei*



<http://www.cultura.net/boomingplants/brandegeesage.html>

- Originally: *Salvia mellifera* Greene ssp. *revoluta* (Brandegee) Abrams
- Then: *Salvia brandegeei* Munz; finally *Salvia brandegeei*
- Named for Townsend (1843-1925) and Mary Katherine (Layne) Brandegee, pioneer western botanists - collected in CA and Baja CA

© Project SOUND

Use like Black sage



http://www.plantsystematics.org/imgs/dwain/Lamiaceae_Salvia_brandegeei_26634.htm

- Drought tolerant shrub - especially in aroma or habitat gardens
- Foundation plant; back of beds
- Nice massed with other Salvias & local shrubs, perennials



<http://www.landscaperesource.com/plants/salvia-brandegei.htm>



<http://www.lanollis.com/frames-01-collections/plants/06-salvia-brandegei.html>

© Project SOUND

'Pacific Blue' *Salvia* cultivar



http://www.suncrenursery.com/plts_show.php?id=salvbrpb



http://soquelnursery.com/perennials_Salvias.html

- Quite similar to *S. brandegeei* in habit, foliage - but with light or dark blue flowers
- Possibly hybrid with *S. munzii* or other blue-flowered *Salvia* - much variability among those sold under this name
- Very easy to grow & reliable in garden setting

© Project SOUND

The Brandegees – alone and together –
put in a prodigious amount of time in the
field and herbarium



- As Curran -
 - ~555
 - 1853 [1876]-1895
 - Mostly from 1880's
- As Brandegee -
 - ~ 1200 records (2000 total - about 60% are Katherine's)
 - Dates: 1876-1922

© Project SOUND

To become a household name, **focus on plants that gardeners will like**, not those with other, equally important, virtues

*Brandegee's woollystar – *Eriastrum brandegeae*



©2012 Neal Kramer

© Project SOUND



<https://polemoniaceae.wordpress.com/eristrum/>

- ***Eriastrum*** :
 - Genus of at least 16 species, mostly annuals (one perennial), native to arid southwestern North America.
 - Most diverse in California.
 - Currently the subject of much revisionary study and several species have been described in recent years. Active research on this interesting genus is ongoing.

© Project SOUND

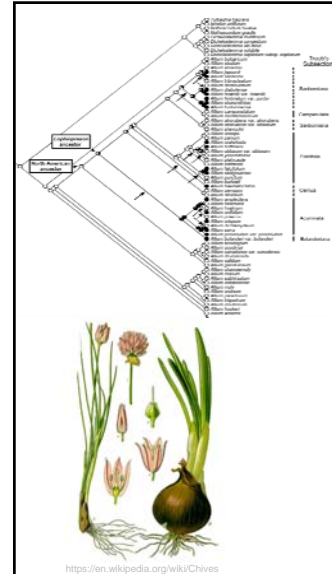
*Brandegee's woollystar – *Eriastrum brandegeae*



http://herbaria4.berkeley.edu/flora_display.php?fid=24588
http://www.calflora.org/cgi-bin/species_query.cgi?where-taxon=Eriastrum+brandegeae

- First collected by K. Brandegee - ? Date and 1892
- *Eriastrum brandegeae* to *E. brandegeae*,
- *E. tracyi* ?? - the same species
- Volcanic soils, 2600-3200 ft.
- CNPS Endangered List (B1.2) threatened by grazing and vehicles.

© Project SOUND



The *Alliums* (onions)

- Found in many parts of world
- Most grow in seasonally moist areas (e.g., summer dry)
- 2 N. American centers of diversity:
 - Texas (~15 species + 5 varieties)
 - The California Floristic Province; ~ 40-50 Calif. native species;
- What family do they belong in?
 - Liliaceae - Lily family [USDA Plants]
 - Alliaceae - onion family [Jepson]
 - Amaryllidaceae - [ITIS]

© Project SOUND

Why include native onions in your garden?



- Among the easiest bulbs to grow in our local gardens
- Long blooming period - particularly if they've naturalized to different parts of the garden
- Naturalize - double every year
- Flowers attract nectar-loving insects and birds
- Bulbs are edible (raw, roasted or for flavoring) - other parts may be mildly toxic or edible, depending on species

Early Onion - *Allium praecox*

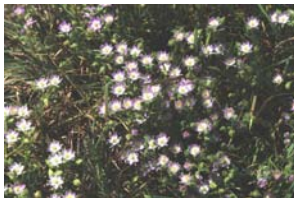


©2006 Steve Matson

Early Onion - *Allium praecox* Brandegee



http://www.efloras.org/object_page.aspx?object_id=8563&flora_id=1



©2010 Gary A. Monroe

- South coast/outer S. coastal ranges to Baja incl. Santa Catalina Isl., San Clemente Isl.
- Grow primarily on shaded slopes in Grasslands, Coastal sage scrub, Chaparral, South Oak Woodlands
- Early collections (1880's-90's by Brandegee in San Diego area
- *Allium hyalinum* Curran var. *praecox* (Brandegee) Jepson - *A Flora of California 1*: 276. [1921]
- *Allium praecox* Brandegee, Zoë. 5: 228. 1906. - current standing

Pink-lover's delight!



©2011 Michelle Cloud-Hughes



©2011 Neal Kramer

- **Blooms:** spring - Mar-May depending on temperature, drought
- **Flowers:**
 - In loose cluster of up to 40 (usually less)
 - Tepals lilac-pink with darker purple midvein
- **Seeds:** small, wrinkled with a bumpy seed coat

© Project SOUND

Shady is best – good for those ‘problem’ areas



http://www.smmflowers.org/bloom/species/Allium_praecox.htm



http://www.smmflowers.org/bloom/species/Allium_praecox.htm

- **Soils:**
 - Texture: heavy clays best
 - pH: any local
- **Light:**
 - Part-shade best - dappled sun or afternoon shade
- **Water:**
 - Winter: needs good moisture
 - Summer: let soil dry out as flowering ceases
- **Fertilizer:** none; likes poor soils
- **Other:** no mulch or thin gravel is best; can use a thin organic mulch

© Project SOUND

Excellent shade color



[http://calscape.org/Allium-praecox-\(Early-Onion\)?rchr=5c5728e179e5db](http://calscape.org/Allium-praecox-(Early-Onion)?rchr=5c5728e179e5db)



<http://waynesword.palomar.edu/ww0604j.htm>

© Project SOUND

- As an attractive pot plant
- Good choice under trees, on shady slopes
- Tuck around shrubs or in a rock garden, pollinator garden
- Fantastic massed!!

*Glassy onion – *Allium hyalinum*



© Project SOUND

*Glassy onion – *Allium hyalinum* Curran



http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242101366

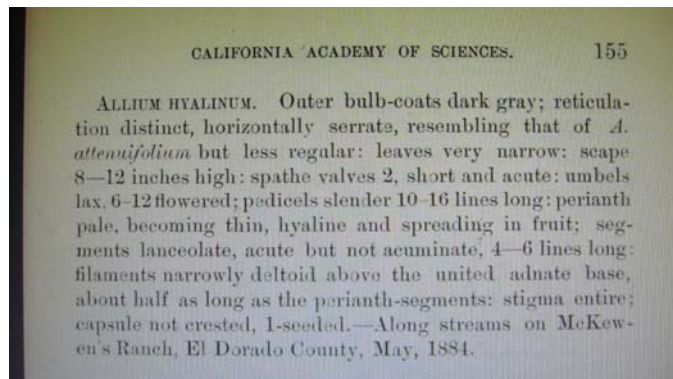


©2009 Neal Kramer

- Sierra Nevada foothills, 50-1,500 m. (160-4,920 ft), from Kern County to Butte County. Also Coast Ranges of Lake, Alameda, Santa Clara, Merced, and San Benito Counties
- Early collectors: T. S. Brandegee [May 1891, Kernville]; Alice Eastwood [Apr 1895, Kaweah (Tulare Co.)]; Katharine Brandegee [Jul 1905, Giant Forest]

© Project SOUND

Curran, Mary Katherine. 1885. Bulletin of the California Academy of Sciences 1: 155

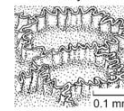


© Project SOUND

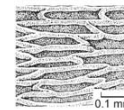
Bulbs (and their coat cells) can be revealing...



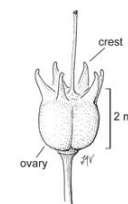
Allium hyalinum



Allium lacunosum



Allium lemmonii



Allium marvinii



Allium nevadense

© Regents of the University of California

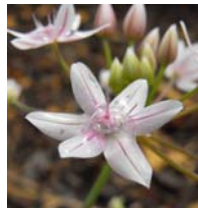
http://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=12589

- Bulb 5--12 mm, ovoid to +-spheric, generally clustered;
- outer coat cells transversely elongate, in obscure, wavy, herringbone pattern;
- inner coats light yellow.

© Project SOUND



<https://botanicalramblings.com/2015/03/29/march/>



By Stickpen - Own work, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=9899250>

Flowers are petite & cute

- **Blooms:** spring - usually April-May in S. CA
- **Flowers:**
 - In loose umbels of up to 25 flowers
 - Tepals (6) pink to almost white; become almost transparent (glassy) with age
- **Seeds:**
 - Small and dark, dull
 - Easy to start from seed
- **Vegetative reproduction:** produces new bulbs readily:
 - About same size a parent bulb; not clustered about the parent, but loose in soil

© Project SOUND

Easy to grow bulb



<http://pacificbulbsociety.org/pbswiki/index.php/YosemiteNationalPark>

- **Soils:**
 - Texture: any well-draining
 - pH: any local
- **Light:**
 - Full sun to part-shade
- **Water:**
 - Winter: good soil moisture until leaves wither
 - Summer: no summer water best, but can take occasional water better than most bulbs
- **Fertilizer:** none; likes poor soils; $\frac{1}{2}$ strength in spring from plants in containers
- **Other:** manage as with other native onions

© Project SOUND



J.S. Peterson, hosted by the USDA-NRCS PLANTS Database



<http://www.pacificbulbsociety.org/pbswiki/index.php/TildenBotanicGarden>

Adaptable onions

- As an attractive pot plant
- Naturalize (good re-seeder) w/ native grasses, wildflowers
- Foreground of beds, along walkways, etc.
- Vegetable garden - use as chives



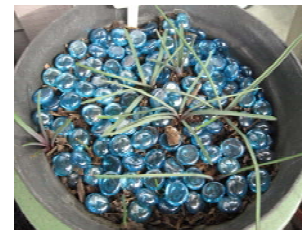
<http://amaryllidaceae.e-monocot.org/taxonomy/term/9600>
© Project SOUND



Allium praecox (small onion)
<http://www.hazmac.biz/021118/AlliumPraecox.jpg>

Raising native onions from seed is easy

- Start in fall/winter in pots
- Sprinkle seed on moistened potting soil
- Cover with thin layer of potting soil and $\frac{1}{4}$ inch layer of gravel.
- Water in and keep soil moist; place pots in bright shady place
- Taper off water in early summer (leaves will start browning)
- Place pot in cool dry place 'til fall
- Bulbs ready to plant out in garden after 2-3 years



© Project SOUND

A garden can be refuge for rare plants, a living laboratory as well as a place of enjoyment

The Brandegee's San Diego garden was living proof that gardens are important laboratories



<http://ucjeps.berkeley.edu/archon/?p=digitallibrary/request&id=1&fields=1&reference=ps.berkeley.edu/%2Farchon%2F%3F%3Ddigitallibrary%2Fdigitalcontent%26id%3D1>

© Project SOUND

So sad – all that's left today are the memories....



<http://www.101que.com/links/wwr-101.jpg>

© Project SOUND



© Project SOUND

2016 Season - Rediscovering Eden:
S. California Gardens for the 21st Century



© Project SOUND

Learn more about the Brandegees

- http://www.cglhs.org/files/eden_vol14_no4.pdf
- http://www.cnps.org/cnps/publications/fremontia/Fremontia_Vol32-No2.pdf
- https://arizona.openrepository.com/arizona/.../1/dp_07_03-128-162.pdf

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Next month: **Rainy Delights:** how to build
a rain garden and permeable swale



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