California Native Plant Society

Dedicated to the Preservation of the California Native Flora

The California Native Plant Society is an organization of laymen and professionals united by an interest in the plants of California. It is open to all. Its principal aims are to preserve the native flora and to add to the knowledge of members and the public at large. It seeks to accomplish the former goal in a number of ways: by undertaking a census of rare, endangered, and extinct plants throughout the State; by acting to save endangered areas through publicity, persuasion, and, on occasion, legal action; by providing expert testimony to governmental bodies; and by supporting financially and otherwise the establishment of native plant preserves. Its educational work includes: publication of a quarterly journal, *Fremontia,* and a periodic *Bulletin;* assistance to teachers and school projects; meetings and field trips and other activities of local chapters throughout the State. Non-members are welcome to attend meetings and field trips.

The work of the Society is done by volunteers. Money is provided by the dues of members and by funds raised by chapter plant sales. Additional donations, bequests, and memorial gifts from friends of the Society can assist greatly in carrying forward the work of the Society.

Dues include subscriptions to *Fremontia* and the *Bulletin.*

Individual	$ 6	Contributing	$ 100
Family	8	Patron	250
Student	4.50	Donor	500
Supporting	20	Benefactor	1000
Sustaining	50	Life	250

Send check with address and ZIP code to the Treasurer.

ADDRESSES

Treasurer; dues and subscriptions; changes of address: CNPS, 2490 Channing Way, Berkeley, CA 94704

Officers and General Society Matters: care of Virginia Rumble, Corresponding Secretary, CNPS, P.O. Box 639, Arcata, CA 95521

Fremontia: Margedant Hayakawa, Editor, P.O. Box 100, Mill Valley, CA 94941

Bulletin: Alice Howard, Editor, Herbarium, Department of Botany, University of California, Berkeley, CA 94720

OFFICERS

Honorary President . . . . . Lester Rowntree
President . . . . . John Sawyer
Vice-President . . . . . James B. Roof
Recording Secretary . . . . . Horace K. Burr
Corresponding Secretary . . . . . Virginia Rumble
Treasurer . . . . . Don Falconer

CHAPTER PRESIDENTS

Dorothy King Young Chapter, Gualala . . Dorothy King Young
Livermore–Amador Valley . . . . . Pat Williams
Milo Baker . . . . . Betty Lovell
Monterey Bay . . . . . James R. Griffin
Napa Valley . . . . . Stephen Rae
North Coast . . . . . James Smith
Sacramento Valley . . . . . Joy A. Kester
San Diego . . . . . Bill Knerr
San Francisco Bay . . . . . Baki Kasapligil
San Luis Obispo County . . . . . L. Holland
Santa Clara Valley . . . . . Natalie Hopkins
Sierra-Santa Monica . . . . . Grace Heintz
Southern California Botanists . . . . . Martin F. Stoner

OTHER DIRECTORS

Paul Badger, Susan Fruge, Gunder Hefta, Leslie Hood, Alice Howard, Don Lynch, Marian Reeve, Wayne Roderick, Wayne Savage, G. Ledyard Stebbins, Dean Taylor, Helen Witham

COMMITTEE CHAIRMEN

Area Preservation . . . . . Leslie Hood
Bylaw Reform . . . . . John Sawyer
Chapter Affairs . . . . . Joyce Burr
Editorial . . . . . Robert Ornduff
Educational . . . . . Warner Marsh and J. Martin Weber
Field Trips . . . . . Ted Niehaus
Horticultural Advisory . . . . . James B. Roof
Legislative Liaison . . . . . Marian Reeve
Membership . . . . . Don Lynch

Director, Rare Plant Project . . . . . W. Robert Powell
Fremontia Editor . . . . . Margedant Hayakawa

FREMONTIA

Vol. I, No. 4 January 1974

MATERIALS FOR PUBLICATION

Members and others are invited to submit material for publication in *Fremontia* and the *Bulletin.* All time-value material should be addressed to the *Bulletin. Fremontia* is a journal for laymen about California plants. It hopes to be both readable and scientifically accurate. Technical botanical articles should be directed to other more scholarly journals. Please double-space copy, using wide margins and fresh typewriter ribbon, on 8½-by-11 paper, and include name, address, and phone number on the MS. As a general rule, in the interest of consistency, botanical nomenclature will conform to Munz, *A California Flora.* Please identify each plant referred to by its botanical name and, if there is one, by its common name. Photographs should be black-and-white glossy prints, preferably 8-by-10 size or accompanied by negatives.

THE COVER:

A flower of *Carpenteria californica,* photographed by Dan Cheatham, who wrote the article on page 3 about the plant's complicated history.

CARPENTERIA, THE MYSTERY SHRUB

by Norden H. (Dan) Cheatham

I became interested in the story of *Carpenteria californica* when I was working with the U.S. Forest Service's program of establishing research natural areas. In 1970, Bob Thompson, then district ranger for the Pine Ridge District of the Sierra National Forest, initiated action to protect stands of this rare and beautiful California endemic shrub. It fell upon me to prepare the necessary paper work, and thus I got acquainted with the plant's fascinating history.

Before the Gold Rush, California plants became known to the rest of the world mostly through explorers, who sent home collections of herbarium specimens and seeds, usually after long and arduous journeys. These collections were studied with interest and enthusiasm by taxonomists, and plants grown from collected seeds found their way into gardens of Europe and the United States. So it was with *Carpenteria californica,* but its story is more complicated. The only known natural population was lost after being discovered. Its original and very limited location was found again only after twenty-one years. And thirty years after its discovery it was just beginning to be reported in European gardens, having arrived by a number of difficult-to-trace routes. Meanwhile at the University of California Botanic Garden in Berkeley the source of seedlings growing there remained a puzzle forty years later.

Discovery and Rediscovery

John C. Fremont collected the plant on his third western expedition somewhere in the "Sierra Nevada of California, probably in the headwaters of the San Joachin." [sic] In his *Flora of California,* W.L. Jepson describes the event as follows:

> On reaching Walker Lake on his 1845 expedition Fremont divided his command, sending his lieutenant, Joseph Walker, south along the east side of the Sierra Nevada to make a winter camp on Kern River and await Fremont's coming in the early spring. Fremont himself crossed the Sierra Nevada at or near Donner Pass on December 5 and obtained supplies at Sutter's Fort. On his way to rejoin Walker, traveling south through the Great Valley, Fremont crossed the San Joaquin River, a full-flooded stream emerging from the Sierras, and on meeting the Kings River mistook it for the Kern and made a fruitless attempt in midwinter to breast the most impassable portion of the Sierra Nevada between the San Joaquin and the main Kings. Without any question, it was while engaged on this adventure, during which he was baffled and turned back to the San Joaquin plain, that he discovered this very rare endemic.

This illustration accompanies John Torrey's original description of *Carpenteria californica.* This drawing was made from an incomplete herbarium specimen collected by John C. Fremont on his 1845 expedition to California.

This woodcut was published in England in 1880 and may well be the first published illustration showing *Carpenteria californica* in full bloom.

Fremont sent his plant collections to the noted botanist John Torrey. Torrey made his original description from an incomplete specimen, having received, he recounts, material "in fruit, but . . . attached to them a few withered and imperfect flowers . . . sufficient however to show the essential characters of nearly all the organs." It was better luck than he had had with the discoveries of Fremont's second expedition, the fate of which Torrey described in his work *Plantae Fremontianae*:

> In the gorges of the Sierra Nevada, a mule loaded with some bales of botanical specimens gathered in a thousand miles of travel, fell from a precipice into a deep chasm, from whence they could not be recovered. A large part of the remaining collection was destroyed, on the return of the expedition, by the great flood of the Kansas River.

Torrey chose to name the new genus "in memory of my excellent departed friend, the late Professor Carpenter of Louisiana, who for many years laboriously and successfully investigated the botany of his native state, but who was suddenly arrested in his career while preparing an account of his researches."

Edward L. Greene, University of California botanist, writing in *Pittonia* in 1887 says,

> Some forty years have elapsed since General Fremont brought from some uncertain locality in our California mountains the branch with leaves and capsules on which this genus is based. I am not aware that any botanist or collector has again met with it up to the present time; but a few seedlings of it have been growing upon the grounds of the University at Berkeley for perhaps some ten years past, the seeds having been derived from some person whose name and address are long since lost, who sent mature capsules in a letter, for identification: so that there is no new information forthcoming yet concerning the exact habitat of *Carpenteria californica.*

Imagine Greene's chagrin when a few months later he reports,

> Since publication of pages 67 and 68, one friend has called my notice to the fact that *Botanical Magazine* of last year gave an excellent figure of *Carpenteria californica* as it flowered in England; and another has assured me that the shrubs are advertised for sale by an horticultural firm in Philadelphia; so that the plant is less rare than I had supposed.

What Dr. Greene didn't know was that in 1876 zoologist Dr. Gustav Eisen brought full-flowered specimens to Dr. Albert Kellogg of the California Academy of Sciences, who completed Torrey's original incomplete description and sent specimens to Asa Gray, who duly reported on it in the *Proceedings of the American Academy of Arts and Sciences* (1880). Writing seventeen years later, W.L. Jepson describes Eisen's contribution:

> No definite locality was known for *Carpenteria* until Dr. Gustav Eisen rediscovered it in Fresno County on Big Dry Creek, in the foothills northeast of Fresno City. . . . It grew on the southern exposure of a chaparral hill about a mile above Tollhouse near what is known as the Grape Vine Spring on the road to Pine Hill.
>
> Dr. Eisen collected about twenty-five pounds of the fruit, which was sent to a Washington florist, who distributed the seed to other florists of the eastern United States and Europe. From such a source came the plants that were offered for sale in their catalogs. (*Erythea* V:124, 1897)

Jepson states that the above account is from an oral description by Dr. Eisen, and since Dr. Eisen's papers have been deposited in his native Sweden I have been unable to uncover any additional details of the "rediscovery" of *Carpenteria.*

Horticultural History

While the Americans were puzzling over the origin of *Carpenteria,* the Europeans were delighting in this newly introduced ornamental, although they also were having a mixup of their own. The January 22, 1881 issue of *The Gardener's Chronicle* states that *Carpenteria californica* is "a handsome shrub, native to California, not yet introduced. We await further information concerning this striking plant." This magazine seemed unaware that a few months earlier *The Garden* (October 23, 1880) published the following account written by "W.G.":

> The accompanying woodcut represents a beautiful flowering shrub prepared from specimens sent to us by Mr. John Saul, Washington City, D.C., U.S.A. It is an extremely rare plant, even in its native habitat; so rare, indeed, that Dr. Asa Gray had not seen flowers of it when he prepared the "Botany of California," nor do flowers of it exist in the Kew Herbarium.

This woodcut appeared the same year that Dr. Gray was publishing a description of the plant, *sans* illustration, based on Dr. Eisen's "rediscovery," in the *Proceedings of the American Academy of Arts and Sciences.* I suppose that Mr. John Saul of Washington City, D.C. was the recipient of some of the seed collected by Dr. Eisen in 1876 and that four years was enough to raise it to flower and to establish correspondence with his colleague in England, including the information that "it grows in dry canyons near springs in the Sierra Nevada."

Interestingly enough, a week later *The Garden* published an account signed by "W.E.G., Junior Carlton Club," who claims to already have *Carpenteria* growing in his garden.

> It seems to be an extremely free-growing shrub, throwing up strong shoots from the root, and even from my small plant I have already taken off a rooted bit to keep in a pot under glass in case it should not prove to be hardy.

(Again, the horticulturists knew more about the plant than the botanists did, and the botanists didn't seem to know that the horticultural specimens existed.)

"W.E.G." says that his plant was sent to him by M. Lemoine of Nancy, France. I assume that M. Lemoine also received his seed from Dr. Eisen.

While preparing this article, I corresponded with the Royal Botanic Gardens at Kew and learned that they have an herbarium sheet of *Carpenteria californica* sent to them by Torrey himself which is an isotype, meaning it is part of the original material used by Torrey in his first description of the genus and of the species. They also have a specimen labeled "*Carpenteria californica,* California Saul, Goldring seed 9/80." This supports the view that John Saul was the source of seed that reached England by a route different from M. Lemoine's shipment to "W.E.G."

The plant stimulated so much interest that in July 1885 *The Garden* went to the expense of publishing a photograph of it, rather than the more old-fashioned engraving. The photograph was taken at Munstead, near Goldalming in Surrey in a greenhouse owned by the noted horticulturist, Miss Gertrude Jekyll (1843-1932). This specimen had reached a proud height of seven feet. Others outside the greenhouse had survived severe cold winters, adding evidence of its hardiness. Herbarium specimens from this plant are preserved at Kew.

Miss Jekyll has been credited with being the first person to flower the plant in England. However, she modestly declined this honor and passed it on to Canon Ellacombe in Gloucestershire, and to Mr. Ewbank on the Isle of Wight, both of whom, she suggests, had specimens in flower a year earlier than she. (In 1885? The record is vague.)

Naturally the first blooming of this plant that heretofore was known only from herbarium specimens and germinated seed caused a great deal of interest. One interesting item supplied by the Royal Botanic Gardens at Kew is a copy of a letter written by Mrs. Kate L. Davidson at Ashmore Rectory, Salisbury, on June 15, 1885 (?). She says,

> I daresay your attention has been drawn to the notice of the blooming of Carpenteria Californica for the first time in this country in the current No. of the Garden. This plant is one of the same panfull of seedlings raised by me some years ago from which I sent a plant or plants to Kew and it has bloomed in Miss Jekyll's garden. . . . Pray pardon my troubling you, but I have special interest in the plant from having raised it. I wish I had the honour of first blooming it as well – but I have been a great deal away from home and my own plants have had no special attention.

In the meantime the previously mentioned M. Victor Lemoine and M. Lavallee at Segrez are credited with having it bloom in 1884 (*The Garden,* April 3, 1886). In 1886 C. Wissenbach, Friedhofs-in-Spektor, Cassel, Germany, claims, in *The Gardener's Chronicle,* August 7,

> Two or three years ago, at the time I was foreman at Wilhelmshohe Castle, this species of *Carpenteria* flowered for the first time in Germany.

The history of the introduction is further complicated in 1886 when "J.D.H." (Sir Joseph Dalton Hooker) mentions in *Curtis's Botanical Magazine* that "it was introduced into Europe by our friend Max Leichtline of Baden Baden." (More of Dr. Eisen's seed?) Then in 1887 *The Garden* published a color plate of *Carpenteria* and stated, "It somehow crept into English gardens in a mysterious way, and without the trumpet-flourish that usually heralds the advent of a beautiful new foreign plant."

All of this was going on while our friend Dr. Edward Greene was puzzling over the plants in the Berkeley Botanical Garden and wondering from whence they came. Unknown to him this plant was a sensation in England, and he didn't know where in his own back yard to look for it.

Its Botany and Distribution

Carpenteria has only one species and so is a monotypic genus. It is most closely related to the genus *Philadelphus,* commonly called mock-orange, which has about forty species, two in California, the remainder in eastern North America and eastern Asia. Both are white-flowered shrubs, but *Carpenteria* is evergreen while *Philadelphus* is deciduous. The flowers of *Carpenteria* are two to two-and-a-half inches across, and the rounded petals spread to form a saucer-like base for the showy cluster of numerous yellow stamens which surround the central pistil. The large white flowers, together with the attractive foliage and reddish-brown peeling bark, make *Carpenteria* one of the handsomest of California's shrubs. "The buds of these flowers terminate the branches, and on opening, instead of remaining horizontal, turn to a vertical position and look frankly at you in a most engaging way," Jepson writes. ("The Long Lost *Carpenteria,*" *Sierra Club Bulletin,* XI:2, Jan. 1921)

Carpenteria has traditionally been placed in the large Saxifrage family (Saxifragaceae) made up of about 80 genera and 1200 species. Both Jepson and Munz in their floras of California have followed this arrangement. Most of the genera in the Saxifrage family are herbaceous perennials, of which in California we have several,

This fine engraving appeared in *The Gardener's Chronicle* in July, 1886 and is from a specimen grown by Miss Jekyll of Munstead near Godalming, Surrey. Miss Jekyll's specimen is credited by some as being the first one to flower in England.

including the saxifrages (*Saxifraga*), alum-root (*Heuchera*), miterwort (*Mitella*), sugar-scoop (*Tiarella*), and woodland-star (*Lithophragma*). Among the woody plants of this family in California which are closely related to *Carpenteria* and *Philadelphus* are the genera *Jamesia, Fendlerella,* and *Whipplea.*

Carpenteria shrubs are eight to sixteen feet high with erect stems from near the base and with the main stems from one to three inches in diameter. The bark on the main stems is very smooth but in the late summer it peels off in broad yellow sheets that are soft and pliable and suggesting buckskin. It is a chaparral species probably adapted to a fire ecology. The leaves are revolute from both edges, thus presenting a reduced leaf area, a characteristic typical of shrubs in hot, dry chaparral situations.

In his *Flora of California,* Jepson describes the range of *Carpenteria californica* as being along streams or shallow gullies on wooded slopes in the higher foothills of the Sierra Nevada, 1500 to 4000 feet, between the main San Joaquin River and the Big Creek tributary of the Kings River. He includes a sketch map which, interestingly enough, agrees with a "windshield estimate" made by the Forest Service in the late 1960s. These maps show that the total range of this unique plant is restricted to an area approximately 225 square miles, a rectangle roughly twelve by seventeen miles on a side. (No wonder it was hard to find it again in the 1800s!) The maps issued by the California Cooperative Soil Vegetation Survey show a concentration of this species on the shallow granite soils centered on the Big Sandy Bluffs.

Why would this plant be limited to such a small range? Is the present population only the remnant of the survivors of the ravages of glacial scouring that once advanced out of the Sierra Nevada? Or, did these stream bottoms and protected spots provide specialized conditions to which the species retreated in order to survive gross climatic changes of a by-gone era? Perhaps this species is a poor colonizer and has not been able to advance out into former haunts as the conditions have again become favorable, because of a germination or a seed distribution problem or dependency on a specialized pollenizing agent with its own restricted natural range.

One could also argue the other side of the coin. Perhaps *Carpenteria* is recently evolved from stock common to one of its nearest relatives, *Philadelphus lewisii,* whose geographical range is in the foothills from Tulare county north to Humboldt and Trinity counties. Is *Carpenteria* a new species which just hasn't had the opportunity to become widely established yet?

Lest the reader think I am avoiding the issues by not suggesting answers to these questions, let me point out that I asked as many of my botanist friends as I could and none of them could shed any light on these problems. These are just more of the riddles that add to *Carpenteria*'s aura of mystery and suggest numerous projects for the research-minded.

The Role of the U.S. Forest Service

In the late 1960s District Ranger Bob Thompson expressed his interest in providing special management for protection of certain areas of *Carpenteria* that occurred in his District. Approximately fifty percent of the mapped stands of *Carpenteria* are on Forest Service land. After appropriate consultation, it was decided that there were two categories of Forest Service land-use allocation that would achieve his objectives. It was decided to utilize both of these.

Accordingly, the Regional Forester established the "*Carpenteria* Botanical Area," thus providing for management practices that recognize the unusual nature of this species and direct the Forest Supervisor to apply management procedures that will enhance the ability of this species to thrive within the designated area. Establishment of this area also provides for public information and enjoyment of this species. The area chosen was the Big Sandy Bluffs area along State Highway 168, leading from Fresno to Shaver Lake. During May and June when the shrub is in bloom, spectacular views of this and other flowering plants can be seen from the highway. Turnouts and interpretive signs will eventually be provided to increase public understanding.

The second area, the Backbone Creek Research Natural Area, was established by the Chief of the Forest Service, in recognition of the Service's responsibility to protect a suitable sample of *Carpenteria* habitat in an undisturbed state. This area is available for use by scholars and scientists whose studies require an area where the natural ecological processes are still essentially intact. This Research Natural Area should be of special interest to botanists, entomologists, zoologists, and other scientists for studying the life history and interrelationships of *Carpenteria* and its associated species such as California buckeye (*Aesculus californica*), redbud (*Cercis occidentalis*), bush poppy (*Dendromecon rigida*), and flannel bush (*Fremontodendron californicum*).

Incidentally, this is one of nine similar research natural areas established in a variety of vegetation types in the National Forests of California. Interested scientists and scholars may conduct research in these areas by contacting the Director of the Pacific Southwest Forest Experiment Station, P.O. Box 245, Berkeley, California 94701.

Note: The author wishes to acknowledge the help and guidance of Dr. Elizabeth McClintock, Dr. Lincoln Constance, and Dr. Herbert Baker in the preparation of this article.