

JANUARY 2023

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## EVENTS

JANUARY
19 - Annual Potluck 6:00-8:30 pm (see Upcoming Events, p. 5)

FEBRUARY
16 - Chapter Meeting, 6 pm Program, 7 pm

## MARCH

14 - Ditch Your Lawn Workshop Levan Institute., (Fee) 7-8:30 pm

16 - Chapter Meeting, 6 pm Program, 7 pm
21 - (continuation) Ditch Your Lawn Workshop, 7-8:30 pm (see Upcoming Events, p. 5)

APRIL
20 - Chapter Meeting, 6 pm Program, 7 pm

## Hope Jahren's Musings -

The Mysteries and Miracles of Plants
by Nancy Nies

GEOBIOLOGIST HOPE JAHREN HAS SPENT HER LIFE studying trees, flowers, seeds, and soil. Lab Girl is her revelatory treatise on plant life - but it is also a celebration of the lifelong curiosity, humility, and passion that drive every scientist."
So begins the book-cover description of Jahren's 2016 memoir. The author is not only a brilliant scientist, but also a gifted writer. Alternating chapters on the stages of a plant's life with chapters on the sta ges of her own personal story, the author uses imagery as a poet would, allowing us to see the world around us in a different way. Here are some examples. Whether or not you're already familiar with the fascinating plant facts Jahren presents, I hope you will enjoy her images as much as I do.

NOTE: In this article Jahren's words will be in
 this font.

## On seeds...

"A seed knows how to wart."
Jahren tells us that a cherry seed can easily wait a century to germinate.

> "Some unique trigger-combination of temperature-moisture-light and many other things is required to convince a seed to jump off the deep end and take its chance - to take its one and only chance to grow."

Even more incredible than a cherry seed's hun-dred-year wait is that of a lotus seed (Nelumbo nucifera) long buried in a peat bog in China. When scientists broke open the seed's coat and coaxed the embryo to grow, they carbon-dated the outer husk and discovered that the seed had been waiting two thousand years.

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Nelumbo nucifera (sacred lotus) flower. Native of Asia.

[^1]the hope of its own future,...while entire human civilizations rose and fell. And then one day this little plant's yearning finally burst forth within a laboratory. I wonder where it is right now."

## On leaves . . .

> "Consider that there can easily be a hundred thousand lobed leaves on a single oak tree and that no two of them are exactly the same....The leaves of the world comprise countless billion elaborations of a single, simple machine designed for one job only--a job upon which humankind hinges. Leaves make sugar."

After the sun's light photons stimulate the pigments within the leaf, ...
"buzzing electrons line up into an unfath-


Quercus lobata (valley oak) leaves. Caswell Memorial State Park, San Joaquin Valley, California, 24 October 2006.


Cylindropuntia bigelovii (teddy-bear cholla cactus). Red Rock Canyon State Park, Kern County, California, 1 January 2021. ment one to the other, moving blochemical energy across the cell to the exact location where it is needed."

Plants have been doing this for four hundred million years, Jahren tells us.

However, . . .
"Every once in a while a plant gets an idea to make a new leaf that changes everything."
It is likely that sometime in the last ten million years, a plant had the new idea of shaping its leaf into a spine rather than spreading it out. The spines, like those of today's cholla cactus, were sharp enough to dissuade animals looking for food, and also reduced evaporation. This new idea . . .
"allowed a new kind of plant to grow preposterously large and live long in a dry place where it was also the only green

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thing around for miles - an ab-
surdly inconceivable success."
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## On fungi...

It is incorrect, Hope Jahren tells us, to call a mushroom a fungus. A mushroom is only the reproductive organ...
"that is attached to something more whole, complex, and hidden. underneath every mushroom is a
web of stringy
hyphae that may extend for killometers, wrapping around countless


Cracked-cap mushroom, approx. six inches in diameter. Wooded area near Horse Meadow, Southern Sierra, clumps of soil and August 2018. holding the landscape together."
The toadstool portion appears only briefly, while the web anchoring it lives for years in what Jahren calls

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"...a darker and richer world."
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She tells us that although a single group of fungi are the worst enemies of trees,
"...making its macabre living by rotting ligneous limbs and stumps of a forest"

- a small minority of this group have become trees' best friends, entering into a symbiotic relationship with them. These, by entwining their webbing through the tree's roots, help the tree by drawing water into the trunk, and,
"...also mine the soil for rare metals, such as manganese, copper, and phosphorous, and then present them to the tree as preclous gifts of the magi."


## On flowers . . .

> "The vast majority of plants faithfully produce a new crop of flowers every single year,"

Jahren writes, though the odds are small that these flowers will be fertilized. She describes an extremely rare, nearly impossible occurrence, which she calls

## "...a feel-good example of symbiosis between ecological soul-mates

- a wasp that can reproduce only inside a fig flower, which in turn can be fertilized only when the wasp lays her eggs inside it and deposits the pollen that coated her when she herself hatched in another fig flower. Unbelievably, the wasp and the fig

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"...have enjoyed this arrangement for almost ninety million years, evolving together through the extinction of dinosaurs and across multiple ice ages."
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She likens it to an epic love story.
Flowering trees and plants, of course, lure insect pollinators with brief sips of sweet nectar. Other trees release their pollen to be carried by the wind. Though an infinitesimal amount of all the pollen produced is actually used,
"[e]nough of it hits its target... to keep the world perpetvally blanketed by the great conifer forests of Canada, the Giant Redwood groves of the Pacific, and the expansive spruce forests that stretch through Scandinavia and Siberia."


Ficus variegata (common red-stem fig). Native to Asia. 17 July 2014. The figs grow in masses on the trunk, each containing hundreds of tiny flowers which are pollinated by minute wasps living in association with the fig.

## On words and actions . . .

If you're like me, and intrigued by the origins of words, you'll be interested in a tidbit that Jahren shares in her epilogue.

> "In languages across the globe, the adjective 'green' is etymologically rooted in the verb 'to grow."

She goes on to say that participants in free-association studies

> "linked the word 'green' to concepts of nature, restfulness, peace, and positivity," ..."a glimpse of green significantly improved the creativity that people brought to bear on simple tasks."

Hope Jahren points out, however, that seen from space, Earth looks less green every year. She attributes this to the fact that every year a tree is cut down in the name of each of its human inhabitants. This brings her to make what she calls a "personal
request" of each reader. - to plant one tree this year. She requests that it not be an ornamental.
"How about an oak?" she asks. "There are more than two hundred species and one is bound to be adapted to your specific corner of the planet.

She mentions several, including the live oak, which . . .
"can grow steadily on the hottest hills of central California, contrasting dark green against the golden grass."

We know, of course, that this is true of our own Quercus lobata (valley oak) and Quercus douglasii (blue oak).

I think Hope Jahren would approve of my ending this collection her musings with a concept attributed to French theologian Hyacinthe Loyson, in a sermon he gave in Paris in 1866:
"Blessed are those who plant trees under whose shade they will never sit." \&


## President's Message: A Naturally-occurring Self-pruning Yew native to the Klamath Mountains

by Rich Spjut

WE USUALLY THINK OF A CHRISTMAS TREE as having an overall conical shape with densely crowded branches and upcurved needles spreading uniformly all around its branches. Most commonly advertised are fir trees (Abies spp.), while western and eastern white pines are also sold. But how about a yew (Taxus), in particular a Klamath yew? The Jepson Manual (2012) describes the Pacific yew,


Taxus brevifolia var. brevifolia. Left: Habit of tree. Right: Close-up of branch with mature berry-like cone, a red fleshy vase-like aril surrounding the seed with an apical opening through which one can see the seed inside.


Comparison of ovular shoots of Taxus brevifolia var. brevifolia with var. polychaeta. Above: var. brevifolia - a short ovular shoot (cone) with immature seed before aril has developed. Top Left: var. polychaeta from Sonoma Co., CA - immature seed cone with five ovular shoots. Top right: var. polychaeta from near Spokane, WA - twig-leaf specimen with three long ovular cone shoots (immature).

Taxus brevifolia, as having a trunk to 18(-25) m , noting also "T. b. var. polychaeta Spjut; T. b. var. reptaneta Spjut." Then adds "See Spjut (2007) ${ }^{\text {i }}$ for alternate treatment of Taxus in CA." Here I report in more detail on the other varieties including an unrecognized Klamath yew (Taxus brevifolia var. klamathensis Spjut) ii.

Variety brevifolia (Pacific yew) would not be a suitable Christmas tree because of its irregular branching, especially the relatively long branches, which spread more upwards than horizontal. This yew occurs widely in the Pacific Northwest, reaching its


Three growth forms of Taxus brevifolia var. reptaneta. (At left) Top: Avalanche shoot Libby Mt. in MT with numerous ascending stems debarked in 1992 for isolation of the anticancer drug taxol. Middle: Stem of yew lifted off the ground among various yew branchlets, Flathead Natl. Forest, MT, Aug. 1992. Bottom: Ramet growing around the base of Douglas fir in the eastern Cascade Range of WA south of Leavenworth along Icicle Creek, Aug. 1992.
southern limits in California along the coast in the Santa Cruz Mountains and Yosemite Valley in the Sierra Nevada (Calflora). It has been reported as far south as Tulare County ${ }^{\text {iii }}$, but without support from herbarium specimens that could have been lost from the 1906 San Francisco earthquake fire. Its apparent disappearance from the southern Sierra Nevada is probably due to human activity; one might even speculate it was once in Kern County before the uplift of the Transverse and Coast Ranges (Spjut 2007).

Variety polychaeta (Worm cone yew) is a tree similar to var. brevifolia that differs by producing multiovular shoots, elongated and worm-like, or short branched near base, in contrast to the usual short 1 or 2 (often unequally developed) ovular shoots
tinues to thrive and reproduce vegetatively as well as sexually. Two other growth forms of var. reptaneta are generally recognized. One primarily occurs in the understory of coniferous forests in which the ramets develop at more distant intervals, often in close mutualistic-like association with Douglas fir. A third, known only from northwestern Montana, is similar to the prostrate form of the Canada yew ( $T$. canadensis) by its branches creeping along the ground for hundreds of meters without individual distinction of a plant. It remains to be determined whether this low branch form originates from a branch near the base of a tree that has since disappeared, or reproduces its prostrate form by seed.

Variety klamathensis (Klamath yew) is a tree-that

in the typical and other varieties. Var. polychaeta is relatively uncommon, occurring at widely scattered locations in the Pacific Northwest.

Variety reptaneta (Thicket yew) is a shrub with ascending branch-like stems. The epithet reptaneta refers to plants forming impenetrable thickets - in open sunny north to east-facing drainages at mid elevations as seen in the type from Siskiyou County near the corner of Humboldt and Trinity counties. The plants reproduce asexually by layering - a rooting stem in contact with the ground from which a clonal plant develops and becomes detached from the parent through decay of the connecting root such as described for the Canada yew, T. canadensis. The individual clone, which is the same genotype, is called a genet or ramet. In these shrub yews, layering regularly occurs without injury to the parental plant. Both the parental and new clone (ramet) con-

Klamath yew compared to Irish yew. Top left: Solitary tree with old snag branches; these are the branches that persist after fire these are the branches that persist after fire
or other disturbance, the dark green is new growth of epicormic branches as a result. Top center: Bole of Klamath yew within a dense forest of yew, the bole characterized by abundant dark knot-like shallow depressions (epicormic buds) from which epicormic shoots grow out of after disturbance. Top right: Illus-
tration of Irish yew at Florence Court, Ireland. grow out of after disturbance. Top right: Illus-
tration of Irish yew at Florence Court, Ireland. Lower left: Close-up of trunk of Klamath yew Lower left: Close-up of trunk of Klamath yew
densely covered with very short epicormic leafy branches and old needles, completely obscuring the trunk.
unlike the typical variety - can survive fire. In regenerating in open areas, short epicormic ${ }^{\text {iv }}$ branches grow abundantly from the main trunk. Its overall compact growth form is columnar to conical in shape, the result of which may be referred to as selfpruning. I discovered this new variety in southern Oregon in the eastern Klamath Region while conducting a survey of white corn lily (Veratrum californicum) in the western United States in August 2011.

The appearance of the Klamath yew resembles those in European topiary. Its columnar form also appears similar to the Irish yew, which was discovered by a farmer in 1760 , George Willis, who
 Young self-pruning Klamath yew. Natudug up the only exis- ral growth, not likely from browsing by tence of the two seed- deer.


Topiary Klamath yew parkland in southern Oregon. Taller trees in the background are white fir (Abies concolor).
bearing (female) trees growing on a rock in northwest Ireland and transplanted them, one to his garden and the other he gave to his landlord, the Duke of Enniskillen. Willis' plant lived for about 80 years, while the other lived on to be the source of cuttings for the Irish yew cultivated in many areas of the world, even in such warmer places as Redding, CA. ${ }^{v}$ Its similarity to columnar forms of Klamath yew is unusual when compared to the typical Pacific


Separate pollen (top) and seed plants (bottom) of Klamath yew, Aug. 2014. Pollen produced in August is unusual for yew in the Pacific Northwest. Yellow arils shown for seed cones are also unusual.


Yew topiary at Elvaston Castle, Derbyshire, Veitch \& Sons, 1881 vi
yew; the Irish and Klamath yews can be distinguished by their branching, all upright in the Irish yew, spreading horizontal in the Klamath yew, and also leaf anatomy (Spjut 2007). Other distinctive features of the Klamath yew are swollen trunks, pollen produced in midsummer, and occasional yellow arils on some plants. Varietal status instead of species status is weighted on leaf anatomical character differences among species. As to commercial growing for Christmas trees, it would not be suitable because of its slow growth and high cost as seen advertised for similar European topiaries of T. baccata. ©

## REFERENCES

i Spjut:RW, 2007. Taxonomy and nomenclature of Taxus. J. Bot. Res. Inst. Texas 1(1): 203-289. A phytogeographical analysis of Taxus (Taxaceae) based on leaf anatomical characters. Ibid., 291-332.
ii A new variety of Taxus brevifolia from the Pacific Northwest of North America. Abstract submitted to the IV International Yew Workshop: Management, conservation and culture of the yew forests in Mediterranean forest ecosystems. Poster presented at Paratge Natural d'Interès Nacional de Poblet October, 23-25, 2014. Accepted for publication in 2015. Taxus brevifolia var. klamathensis Spjut, http://www.worldbotanical.com/taxus_ brevifolia_var_klamathensi.htm.
iii Sargent, Silva of North America 1896. Jepson, Silva of California, 1910; Univ. Press, p. 164-168.
iv Epicormic shoots, in contrast to adventitious shoots that develop spontaneously from buds lacking a vascular connection to the meristem, are a regular developmental pattern on the aerial system of the tree such as on the bole and/or branches. They originate from dormant buds in or beneath the stem-bark with a connection to the vascular tissue, and become activated-upon stress such as fire or sudden exposure to light-to produce new branches (Kormanik \& Brown, 1967). Epicormic bud initiation is determined by the 'genetic growth plan' (Meier et al., 2012). Both sequential and cauliferous shoots are recognized in Taxus brevifolia var. klamathensis. They are of two kinds (a) short branches 1-2 m long, and (b) leafy branchlets usually $<30 \mathrm{~cm}$ in length.
v Hageneder F, 2007. Yew. A History. Sutton Publishing Ltd., Thrupp-Stroud-Gloucestershire. Plants observed by Spjut growing along a shady side of a motel in Redding, CA.
vi . Veitch and Sons, A Manual of the Coniferae, Publ. by the authors, Kings Road, Chelsea, 1881.


California
Native Plant Society
CNPS is the leader for providing reliable information on California native plants and plant conservation. Comprehensive information about California's flora and vegetation communities is available throughout the state for conservation and educational purposes. CNPS's leadership influences personal ethics and actions, as well as public policy for native plant protection.

## Chapter Meetings

## urceoming TOPICS

Thursday, January 19, 2023
6-8:30 pm
Topic:
POTLUCK \& SLIDE SHOW
Place: Larry E. Reider Education Ctr. at 2000 K Street, Room 201

BRING potluck items to share. Please bring your own dinner service as we try to minimize waste.

SHARE photos - Bring your flower and hike photos on a chip or thumb drive and share them with the group.

Please use the parking structure located east of the building and enter through the doors accessed from the parking structure. The front doors lock at 5 pm .

A short business meeting will follow. If you have topics to discuss please send to pgipe@igc.org.

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Thursday, Feb. 16, 2023
6-8:30 pm
Topic: The Flower Formula Presenter: Dr. Maynard Moe
Place: Larry E. Reider Education Ctr. at 2000 K Street, Room 201

Dr. Moe is the author of Kern County Flora: A Key to Vascular Plant Species of Kern County. We thought it would be good to offer this introductory program again.

Tuesdays, March 14 \& 21, 2023
7-8:30pm
Topic: Ditch Your Lawn
Presenter: Monica Tudor
Place: Room 222,
Bakersfield College, Southwest Campus, 9400 Camino Media, Bakersfield, CA 93111.

How to get rid of your lawn and replace it with natives. - A Levan Institute Program
Fee: $\$ 20$
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Thursday, March 16, 2023
6-8:30 pm
Topic: TBA
Presenter: TBA
Place: TBA

Thursday, April 20, 2023
6-8:30 pm
Topic: The Blue Oak Nursery in Visalia
Presenter: Peyton Ellas, owner, Place: TBA
Find out what she's growing these days.

All in-person chapter meetings are held the 3rd Thursday of each month.

Meeting times:
$6-8: 30 \mathrm{pm}$ : 6 pm - Socializing, plant ID and gardening discussion groups, followed at 7 pm by program presentation and concluding with a short business meeting.


Monica and a native plant customer confer in her yard on plant sale pick-up date - October 15, 2022.

## 2022 Kern Chapter <br> CNPS Annual Plant Sale

by Monica Tudor

THANK YOU TO EVERYONE WHO HELPED AT the 2022 CNPS Annual Plant Sale. We did very well with very few glitches, less than a half dozen missed plants out of over 350 plants ordered.

Update:<br>Bakersfield Cacti Project<br>by Lucy Clark

LAST DECEMBER WE HAD AN EARLY REQUEST from The Nature Conservancy to help monitor the cacti we planted this year. This is a requirement CA Fish and Wildlife requirement that aims to prove we are taking care of this rare plant. Monitoring occurs annually for 5 years after planting. TNC's Rachel Mason once again herded us cats along Caliente and Tehachapi Creeks.

Thursday, December 15 was a cold, grey morning, but a hardy team gathered to measure the height of each plant, count its pads, and to rate it on a scale of 1 to 5 as to its health. Any notes of interest could be added also. Rachel will prepare the document for CFW, using this information.

We were so pleased to have Ellen Cypher, the expert on this plant, with us. She helped in this task, and said at the end of the morning that she thought our cacti looked very good! None were eaten by insects or critters, and most pads were plump with the very recent rain. Some of the original pads
had grown no new ones, but were larger. Some had $2,3,4$ new pads, the max being 10 !

A big thank you to the members who participated, and cheerfully: Crystal Anderson, Frank Bedard, Ellen Cypher, Fred Chynowth, Diane Farnsworth, Paul Gipe, Clyde Golden, Pat Mumford, Bill Nelson, Donna Rodriguez, and Libby Vincent. It was so nice to be together again, to feel useful, out on the beautiful Beard Ranch, a part of TNC's new Randall Preserve!

If anyone would like to help in the future, just email Lucy Clark at lucyg391@gmail. com, and I will add you to the Cactus Crew!

Kern CNPS New Website Up by Paul Gipe

The new web site, $\underline{\text { https://chapters.cnps.org/kern/, }}$ incorporates the best features of the old site (plant lists, past field trips, and so on) while including several new features.

## NEW E EXPANDED

1 The new web site EXPANDS on the chapter's contribution to habitat restoration of the Bakersfield cactus and valley oaks with photos of members in action. It also features contributions to the Mimulus Memo by Monica Tudor on gardening, and Nancy Nies on unsung women botanists.

2 Sections of the website on plant lists, nearby nurseries, botanical gardens, and field guides have also been updated and EXPANDED.

3 Also NEW is a page on digital aids to plant identification. Instead of relying on a dichotomous key, amateur plant lovers can use common features, such as flower color and the number of flower petals, with a digital database that presents a suite of images that meet the criteria. Users then sort the images to find the best match. This page also introduces iSeek that allows the user to snap an image of a plant with their smart phone. The app then searches an online database of images for the best match. While neither is perfect, both apps make identifying plants easier for the non-botanist.

We thank professional botanist Rich Spjut for maintaining the old website for the past decade. Our new web team of Rich Spjut, Dinah Campbell, Monica Tudor, Sabrina Mehtabuddin, and Paul Gipe welcome your input. If you have ideas for the website, please contact one of them. $\mathbf{~}$

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The Kern Chapter of the California Native Plant Society currently meets the third Thursday of each month via Zoom: Chapter website: kern.cnps.org
The California Native Plant Society is a non-profit organization dedicated to the conservation of California native plants and their natural habitats, and to increasing the understanding, appreciation, and horticultural use of native plants.
CNPS has 31 chapters throughout the state and membership is open to all persons - professional and amateur - with an interest in California's native plants. Members have diverse interests including natural history, botany, ecology, conservation, photography, drawing, hiking and gardening. As a Kern County resident, your membership includes
 dates, gardening advice. Artemesia, CNPS's scientific journal and The Mimulus Memo, the Kern Chapter newsletter published quarterly. Join CNPS or renew your membership online at cnps.org
Membership levels: $\$ 25, \$ 50, \$ 120, \$ 500$ ( $\$ 25$ minimum)
Go Perennial at $\$ 5 /$ month
To unsubscribe/subscribe to Kern CNPS email communications mem(916) 738-7604 membership@cnps.org

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Inside this Issue:


[^0]:    "The tiny seed had stubbornly kept up

[^1]:    The California Native Plant Society is a non-profit organization dedicated to the conservation of California native plants and their natural habitats, and to increasing the understanding, appreciation, and horticultural use of native plants.

