

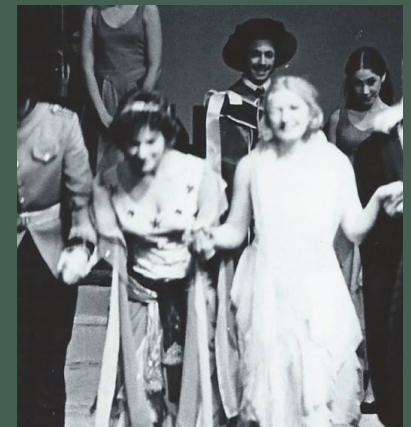


MY FIRST STEPS TOWARDS CREATING AN INCLUSIVE AND HONEST CLASSROOM

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Where did I come from?

- Grew up in a white middle-class family with two college-educated professional working parents
- Lived in an integrated suburb of New York City
 - Tracking in school meant that by high school we were de facto segregated
- Parents were liberal progressives – for that era
- Came of age in the 1960s and 1970s (Hippie era)
- Went to a private wealthy college
- Taught at a private middle/high school for smart rich kids



Where did I come from?

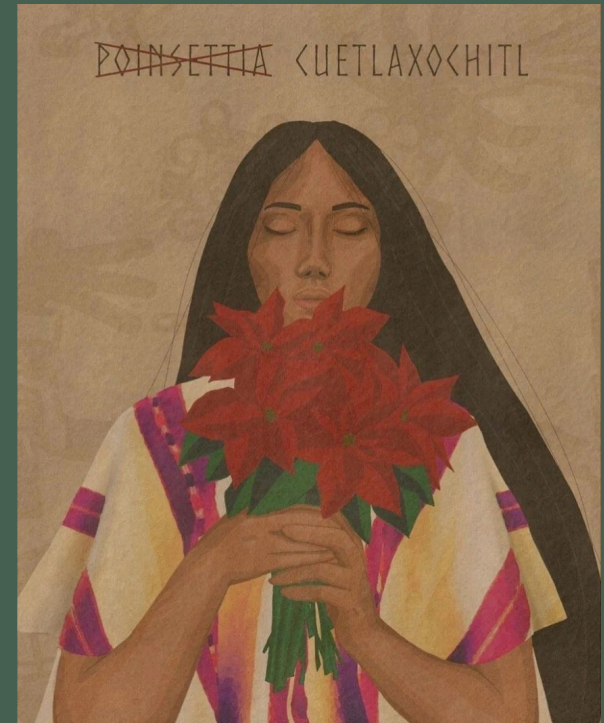
- I have lived (and live) a life of absolute privilege
- I am a certified boomer
- I never questioned standard pedagogical approaches and priorities
- I never questioned the "rightness" and "truth" of western scientific thought
- I never thought about the historical development of ideas or the historical practices that led to their development

How did I get started?

- I moved to UCR
- The pandemic hit
- I served on the UCR General Education Review Committee
 - I learned the concept of “epistemology”
 - “Ways of knowing”
- All of these prompted me to think about my teaching methods and priorities

I developed two goals

1. Create a classroom where the different experiences of different students are valued, where students can contribute and excel in different ways, and where everyone can feel welcome and valued
2. Introduce different perspectives into my teaching, recognizing the white/male/colonial influences in science as well as other sources of bias

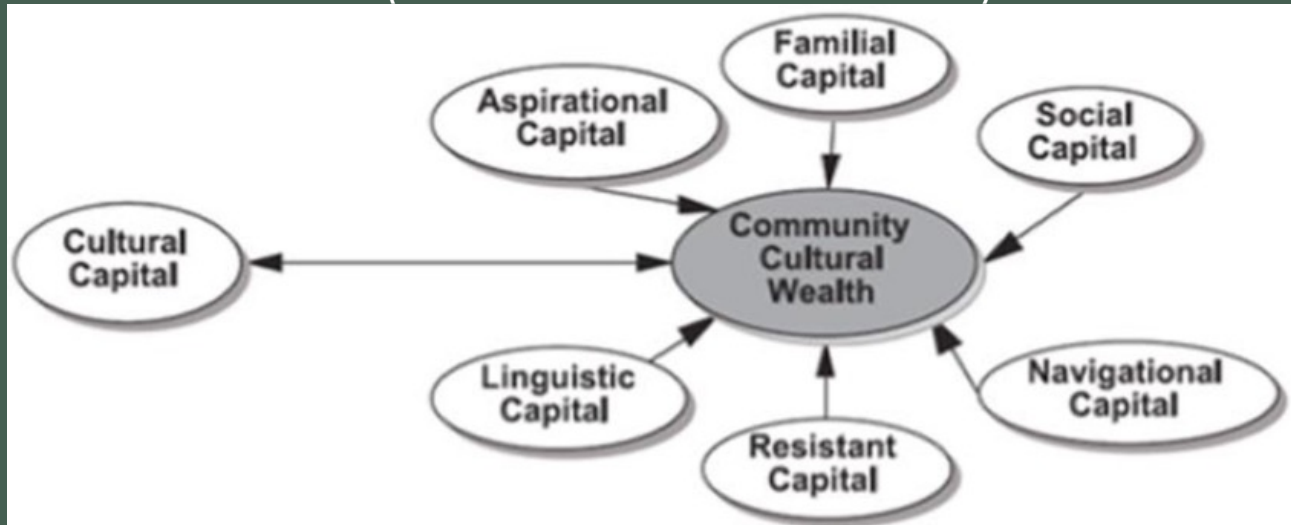


How did I have to approach this?

- Examine my own privilege and perspectives
- Work to identify my own biases and how they are reflected in my teaching and thinking
- Think carefully about the language I use and what it conveys
- Question what I “know” about good teaching
- Question the unique position of accepted scientific systems and concepts as “right”
- Work to identify ways in which science and pedagogy incorporate bias and prejudice
- Read, listen, ask

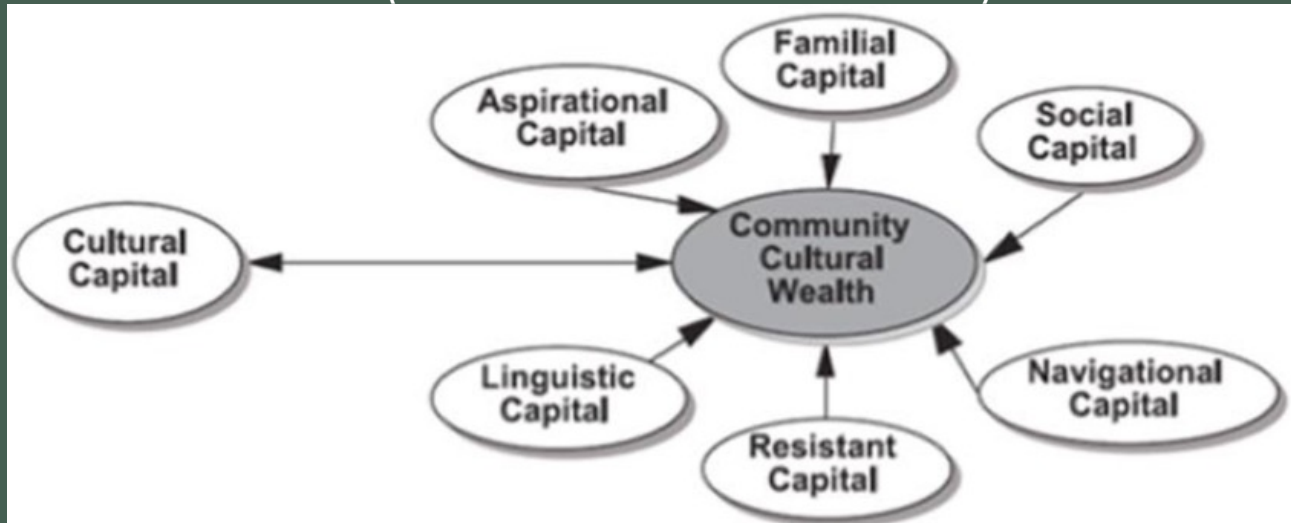
1. Create a classroom where the different experiences of different students are valued, where students can contribute and excel in different ways, and where everyone can feel welcome and valued

- Dr. Tara Yosso (UCR School of Education)



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[https://helpfulprofessor.com/
community-cultural-wealth/](https://helpfulprofessor.com/community-cultural-wealth/)

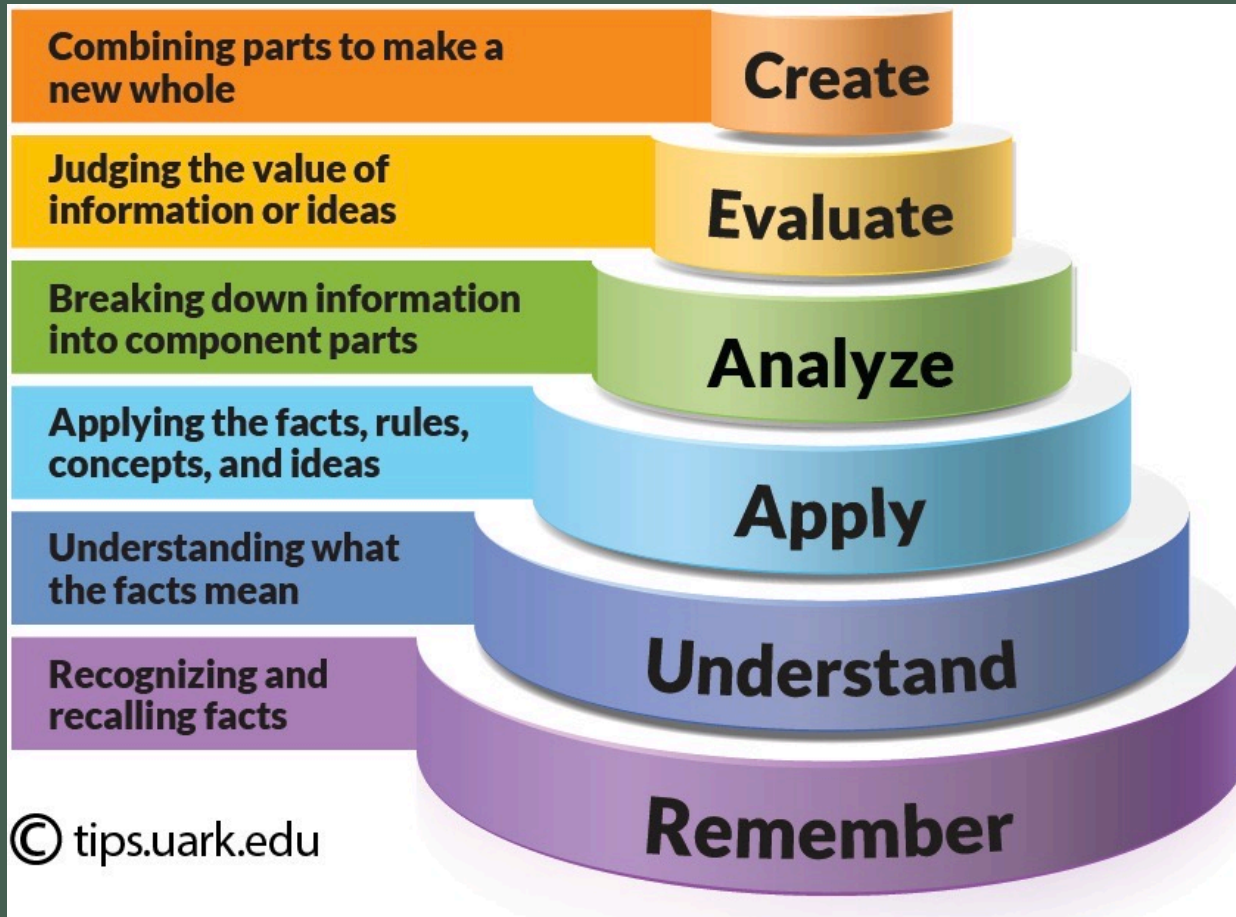
The sociological concept of community cultural wealth posits that marginalized groups possess ... capital that often goes “unrecognized and unacknowledged” (Yosso, 2005). The concept critiques the idea that white upper-middle-class capital is...desirable, and that marginalized groups ...are in deficit in relation to privileged white groups. Instead, Yosso (2005) argues that marginalized groups possess their own forms of capital that are highly valuable, and by judging them only by the standards of the dominant culture in society perpetuates deficit thinking, failing to acknowledge the unique strengths of marginalized groups.

1. Create a classroom where the different experiences of different students are valued, where students can contribute and excel in different ways, and where everyone can feel welcome and valued

- Dr. Tara Yosso's (UCR School of Education) Cultural Wealth Model
 - My vastly simplified take-home: All students have "cultural capital"
 - Skills, knowledge, understandings that come from their experience
 - Only some of forms of cultural capital are valued in our educational system
 - Generally capital that is more (or only) accessible to students from privileged backgrounds
 - Example: Keyboarding and coding skills vs ability to fluently serve as interpreter between parents and medical personnel
 - Example: Having ample time to study and do extra credit, vs having a job and taking care of younger siblings or older relatives
- An inclusive classroom promotes and values diverse forms of cultural capital

1. Create a classroom where the different experiences of different students are valued, where students can contribute and excel in different ways, and where everyone can feel welcome and valued

- Not everyone is good at test taking or answering certain kinds of questions
 - Limiting assessment types disadvantages students who may struggle to demonstrate their knowledge in that format
- Not everyone is good at memorization
 - Understanding, synthesis, application... those are important



Bloom's taxonomy

How have I tried to incorporate these ideas? (Plant Diversity and Evolution)

1. Diverse assessments

a. Weekly quizzes (no exams)

- i. In recent years, have given students a note card they can use on the quiz
- ii. Mixture of short answer and free response

How have I tried to incorporate these ideas? (Plant Diversity and Evolution)


1. Diverse assessments
 - a. Weekly quizzes (no exams)
 - b. Short research paper and oral presentation
 - a. Three sections due sequentially
 - b. Peer review (graded)
 - c. Option to hand in early for our feedback
 - d. No penalty for grammar, vocabulary, punctuation errors unless they are persistent and grievous (uncorrected or incredibly pervasive)

How have I tried to incorporate these ideas? (Plant Diversity and Evolution)

1. Diverse assessments

- a. Weekly quizzes (no exams)
- b. Short research paper and oral presentation
- c. Diverse assignments

Morphology scavenger hunt (based on Dr. Lena Struwe's morphology bingo)

Trait	Photo
1. Entire Leaf Margin	 A photograph showing a green katydid and a single green leaf with an entire margin, illustrating the trait 'Entire Leaf Margin'. The katydid is positioned to the left of the leaf, and both are resting on a light-colored, textured surface. The leaf is ovate with a smooth, entire margin and a prominent midrib.

How have I tried to incorporate these ideas? (Plant Diversity and Evolution)

1. Diverse assessments

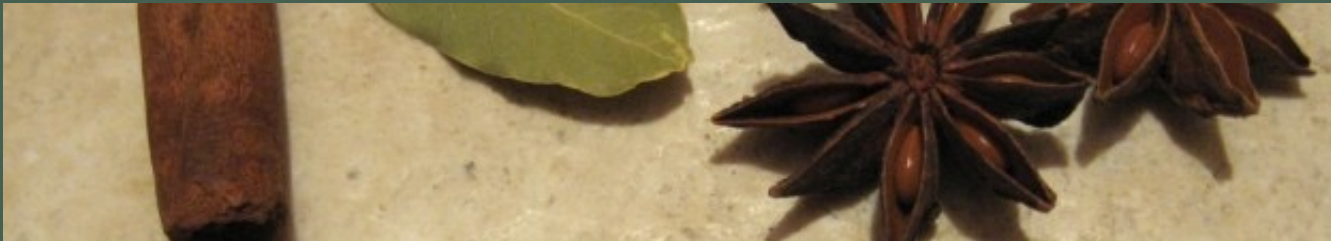
- a. Weekly quizzes (no exams)
- b. Short research paper and oral presentation
- c. Diverse assignments

Blog reading assignments

<https://botanistinthekitchen.blog/> “The basal angiosperm cake”

Origin stories: spices from the lowest branches of the tree

“Why do so many rich tropical spices come from a few basal branches of the plant evolutionary tree? Katherine looks to their ancestral roots and finds a cake recipe...”



How have I tried to incorporate these ideas? (Plant Diversity and Evolution)

1. Diverse assessments
 - a. Weekly quizzes (no exams)
 - b. Short research paper and oral presentation
 - c. Diverse assignments
 - Herbarium plant collection



<https://www.floridamuseum.ufl.edu/herbarium/methods/specimen-preparation-guide/>

How have I tried to incorporate these ideas? (Plant Diversity and Evolution)

1. Diverse assessments
 - a. Weekly quizzes (no exams)
 - b. Short research paper and oral presentation
 - c. Diverse assignments
 - Lab notebook



<https://wardsworld.wardsci.com/biology/keeping-a-great-laboratory-notebook-an-epic-lesson>

How have I tried to incorporate these ideas? (Plant Diversity and Evolution)

2. Give students opportunity to pursue their interests/work at their own speed
 - a. For paper and presentation, they can choose a plant family from a list I provide, or suggest a topic of their own
 - b. The content of part of the paper is structured, but one section is “talk about what you think is interesting about your family/topic”
 - c. Presentations can be any format or medium
 - i. Nearly everyone does powerpoint but we have had cooking demonstrations, videos, etc.
 - d. Lab is unstructured
 - i. We give them a list of questions to investigate but they are free to look at and poke around at what they want
 - ii. Informal and casual, a good time to get to know them and encourage them to ask questions
 - e. Many of the assignments are flexible
 - i. Students have options
 - ii. Most can be handed in early for feedback

How have I tried to incorporate these ideas? (Plant Diversity and Evolution)

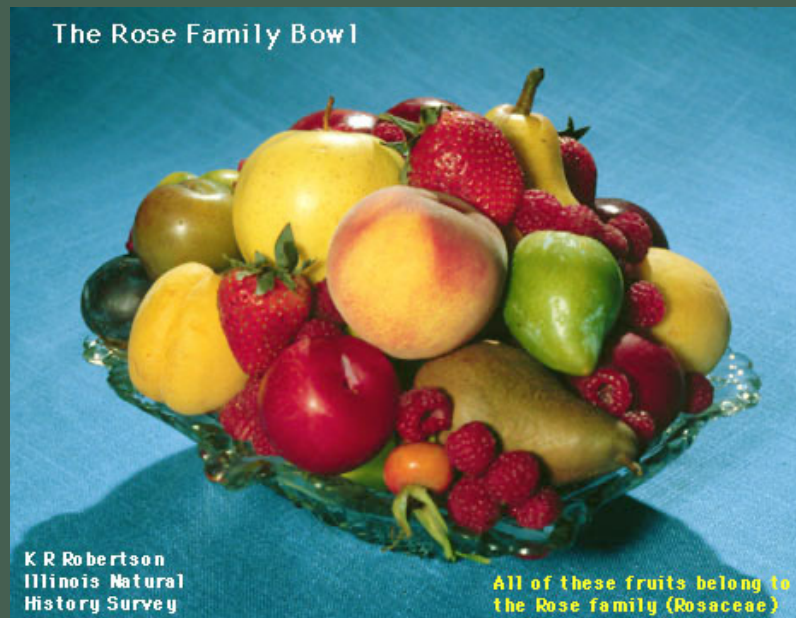
3. Provide materials

- a. I ask students to buy a \$25 "text" (Botany in a Day, Thomas J. Elpel <https://mountain-press.com/products/botany-day>)
- b. All other materials are provided: Spiral notebook, hand lens, inexpensive macro lens, ruler... two small plastic animals to use to confirm they took photos themselves



How have I tried to incorporate these ideas? (Plant Diversity and Evolution)

4. I try to encourage students to share their experiences but that's a hard one
 - a. I am still figuring out yet how to make use of and give credit to each student for their unique skills and knowledge
5. I bring in lots of food



2. Introduce different perspectives into my teaching, recognizing the white/male/colonial influences in science as well as other sources of bias

- To try to “decolonize” the Plant Diversity and Evolution class I have reached out to colleagues, read books, followed up on social media posts, googled for good videos and examples, attended workshops and symposia
- The Plant Evolution and Diversity course is not a pre-requisite for anything so I can choose what I want to include and how I present it
- I am always looking for more content and examples and activities

2. Introduce different perspectives into my teaching, recognizing the white/male/colonial influences in science as well as other sources of bias

- Botany has a long history of colonialism/paternalism/sexism/racism
- Some aspects are pretty obvious
 - Naming plants after abusive racist European/US white men
 - John C. Frémont
 - Collected thousands of plant specimens including “163 new types of plants, including 19 new genera” (<https://plantsandrocks.blogspot.com/2013/03/jc-fremont-was-here.html>)
 - *Fremontodendron* (and other taxa), and the California Native Plant Society's publication *Fremontia*, were named after him
 - He also led the slaughter of up to 1000 Wintu, mostly women and children
 - CNPS has changed the name of their publication to *Artemisia*



CALIFORNIA
NATIVE PLANT
SOCIETY

Protecting California's native flora since
1965

Our mission is to conserve California's native
plants and their natural habitats, and increase
understanding, appreciation, and horticultural
use of native plants.

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FREMONTIA

VOL. 48, NO. 1, NOVEMBER 2020

FROM THE EDITORS

What kind of world do we want, and how do we get there? These are the questions that drive restoration, the central theme of this issue. They are also the questions that have led the California Native Plant Society leadership to initiate an important change to this publication, which will take effect in the spring 2021 issue.

The name of this publication, *Fremontia*, has been a point of concern and discussion since last winter, when members of the CNPS leadership learned some disturbing facts about John C. Frémont, from whom dozens of North American plants, including the flannelbush plant *Fremontodendron californicum*, derive their names. According to multiple sources, including the State of California Native American Heritage Commission, Frémont was responsible for brutal massacres of Native Americans in the Sacramento Valley and Klamath Lake. As a consequence, the CNPS board of directors voted unanimously to rename *Fremontia*, a process slated for completion by the end of 2020.

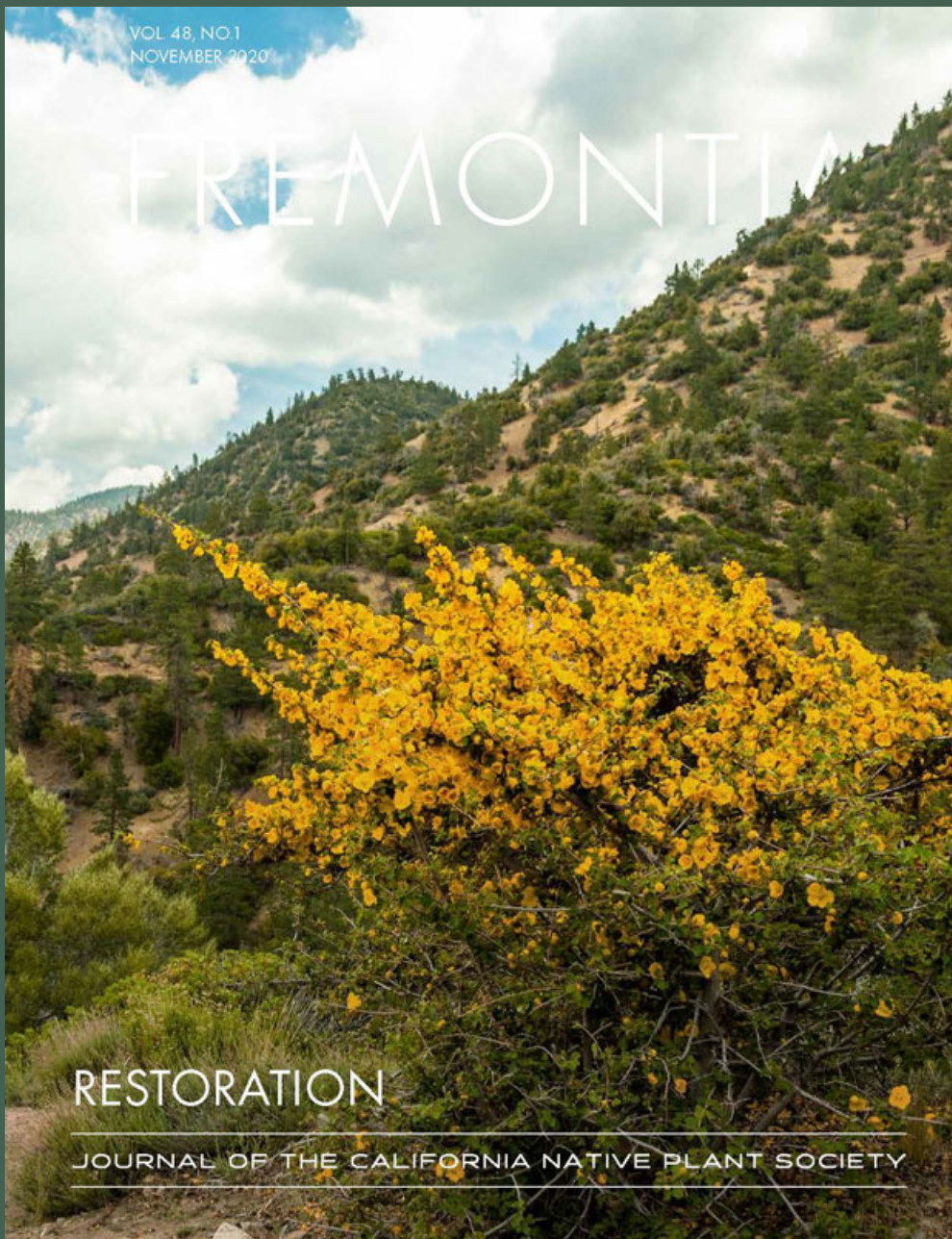
The decision to rename *Fremontia*, a name that dates back to the origins of the publication in 1973, is about the people who have been—and continue to be—systematically excluded from the conservation commu-

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RESTORATION

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VOL 49, NO. 1
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ARTEMISIA

JOURNAL OF THE CALIFORNIA NATIVE PLANT SOCIETY

Mapping California

2. Introduce different perspectives into my teaching, recognizing the white/male/colonial influences in science as well as other sources of bias

- Botany has a long history of colonialism/paternalism/sexism/racism
- Some aspects are pretty obvious
- Other aspects are less obvious
 - Language
 - Scientific classification vs “folk taxonomy” clearly implies one is better than the other
 - Referring to the “discovery” of plants that were known for centuries by Indigenous people
 - Decisions about what we teach
 - Decisions about how we carry out our research and who we collaborate with, how we incorporate diverse voices as equal partners (that’s another talk)

2. Introduce different perspectives into my teaching, recognizing the white/male/colonial influences in science as well as other sources of bias

- Colonial history of names: why don't we use indigenous names?
 - Latin names
 - Names of genera and above convey phylogenetic information
 - They are the same in science around the world
 - Many are entrenched in the literature
 - Common names
 - It's an uphill battle
 - Which indigenous name?
 - Current efforts to replace "miner's lettuce" with the Ohlone "rooreh" have met with mixed results
 - Why the Ohlone name?
 - Why this species?



Arctostaphylos uva-ursi –
kinnikinnick, or bearberry

- **Inuit:** tinnik, tinniik, tinnich
- **Tlingit:** tinx, tinx
- **Haida** (Massett): dinax (berries), dinax tq'a.aay (plant)
- **Haida** (Skidegate): thllgaanga (berries), thllgaanga hlk'a'ii (plant); OR sk'utsgai
- **Ahtna:** dziidzi nage
- **Dena'ina** : dnes (stem), k'enełch'aq'i; nents'ezi
- And many many more

<https://www.nhbs.com/ancient-pathways-ancestral-knowledge-2-volume-set-book>

2. Introduce different perspectives into my teaching, recognizing the white/male/colonial influences in science as well as other sources of bias

- Blog post: Collecting with Lao Chao (Zhao Chengzhang): Decolonising the Collecting Trips of George Forrest

(<https://natsca.blog/2020/07/16/collecting-with-lao-chao-zhao-chengzhang-decolonising-the-collecting-trips-of-george-forrest/>)

- “For years, the curators of museums and living collections, and their visitors have been programmed to respond to and expect talks of the grand, death-defying adventures of our collectors – so much so that we appear to have closed our minds to the realities and injustices of what really happened on expeditions.”
- George Forrest (Scottish) went to Yunnan to collect seeds for Arthur Bulley who wanted to introduce exotic new plants to the public
- From 1904-1932 “his collections number in the 10s of thousands”
- How did he manage?

Collecting with Lao Chao (Zhao Chengzhang): Decolonising the Collecting Trips of George Forrest

- How did he manage to collection tens of thousands of “new” plants?
- He “employed a team of local Naxi people” headed by Lao Chao
- We do not know the names of any other members of the team
- They collected under his numbers EVEN WHEN HE WAS NOT IN CHINA

- “That his affection for, and equally the support and affection from his team is undisputable. But taking a quick look at the names of taxa described by Forrest – of the 418 records not a single one commemorates Lao Chao – and yet he named many after Bulley, his wife, children, his friend Litton and the useful customs clerk, Grierson.”



2. Introduce different perspectives into my teaching, recognizing the white/male/colonial influences in science as well as other sources of bias

- Try to present scientific classification as one possible system, not the best system

- “Artificial” systems

- Based on easily observed characteristics
- Convenient and useful
- Common in every culture and community
- Do not reflect relationships (not predictive)
- This is a judgmental term
 - These systems are logical and valuable
 - The name is used by scientists as a contrast to what they consider more appropriate systems



“Food plants”

“Garden plants”



“Weeds”



- “Natural” systems

- Represent evolutionary relationships
- Closely related organisms grouped together
- How do we know when we have it “right”?
- These systems are useful for scientific study but may not be useful for other purposes

Daisy family (Asteraceae)



Legume family (Fabaceae)



Nightshade family (Solanaceae)

3. Introduce different perspectives into my teaching, recognizing the white/male/colonial influences in science as well as other sources of bias

- Point out examples of imperialistic paternalistic actions in relevant places
 - Euphorbiaceae
 - In 1876 Henry Wickam smuggled 70,000 rubber seeds (*Hevea brasiliensis*) from Brazil to the Royal Botanic Gardens in London where seedlings were grown and transported to Asia
 - In Asia the plants did not have natural diseases or herbivores and could be grown in plantations
 - The Brazilian economy, which had had a monopoly on highly valuable rubber, collapsed



“Bridgestone to invest U.S.\$26.7 million in natural rubber plantations in Southeast Asia” (August 2022)

<https://rubberworld.com/bridgestone-to-invest-u-s-26-7-million-in-natural-rubber-plantations-in-southeast-asia/#:~:text=Bridgestone%20will%20invest%20U.S.%2426.7,material%20used%20in%20producing%20tires.>

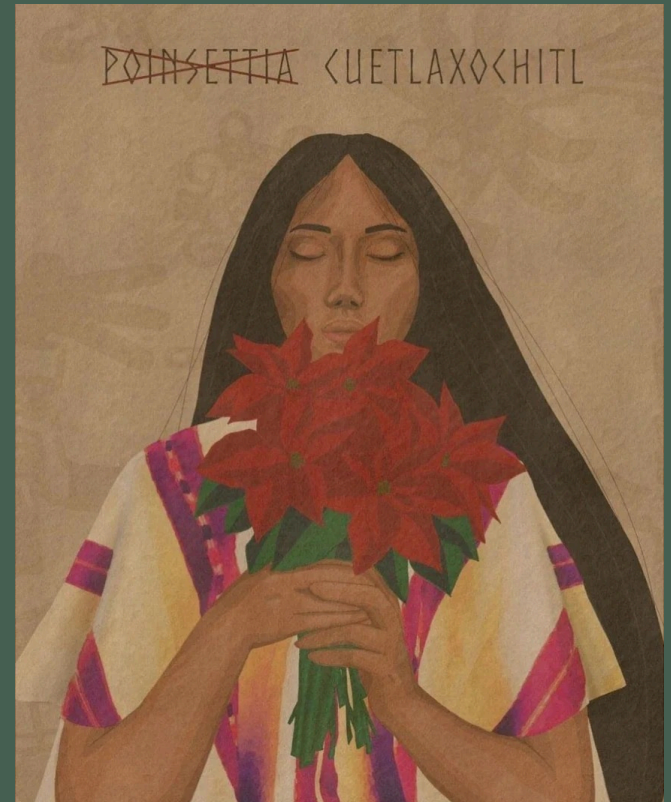
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From this past holiday season on Facebook

“The cuetlaxochitl flower is native to Mexico. This is a sacred flower that was colonized and written off in history as a "discovery" of Joel Poinsett's in the 1800's.

Joel Poinsett was a slave owner who promoted white supremacy and slavery in his travels and in his political career. He has also been responsible for the displacement of many indigenous peoples along the way by forcibly removing them from their native lands.

The Cuetlaxochime originally had nothing to do with christianity or Christmas, they were a sacred plant used in ceremonies to celebrate the birth of Huitzilopochtli during our winter solstices. They were also used for medicinal and healing purposes to cure sicknesses, aid the flow of breast milk, as well as for dyeing fabrics.”



Indigenous Cultures Institute
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t296tf6935u71iMIYa

2. Introduce different perspectives into my teaching, recognizing the white/male/colonial influences in science as well as other sources of bias

- Presentation by a Cahuilla citizen on the Cahuilla understanding of plant diversity
 - Gerald Clarke Jr. : Cahuilla citizen, artist (<https://geraldclarkeart.com>), UCR ethnic studies professor, rancher, father
 - Total miracle of fate that I connected with him



2. Introduce different perspectives into my teaching, recognizing the white/male/colonial influences in science as well as other sources of bias

- Recording of presentation by Dr. Banu Subramaniam to the New England Botanical Society
 - Born in India, attended University of Madras
 - Trained as plant evolutionary biologist at Duke University (private college on the east coast of the US)
 - Professor of Women's and Gender Studies and chair of the Department of Women's and Gender studies at Wellesley College
 - Studies social and cultural aspects of science (particularly biology and botany)
 - "She advocates for activist science that creates knowledge about the natural world while being aware of its embeddedness in society and culture." (Wikipedia)

2. Introduce different perspectives into my teaching, recognizing the white/male/colonial influences in science as well as other sources of bias

- “Decolonizing Botany: 7 November 2020
<https://www.youtube.com/watch?v=HKuWAZQIFFs>
- Colonial impacts on her education in India
- Cultural norms and expectations in graduate school
- Colonialism as an ecological project
 - Extracting resources
 - Imposing western agricultural methods
- Impact of language
 - The “right” name of plants
 - Warlike language of Invasion biology
 - Loaded terms “native” and “invasive”



Lots of resources

- Tara Yosso
 - Whose culture has capital? A critical race theory discussion of community cultural wealth (2006)
<https://www.tandfonline.com/doi/full/10.1080/1361332052000341006>
- Banu Subramaniam
 - Ghost Stories for Darwin: The Science of Variation and the Politics of Diversity
- Robin Wall Kimmerer
 - Braiding Sweetgrass
 - Gathering Moss
- Beronda Montgomery
 - Lessons from Plants
- Bryan Dewsbury
- The Promise and Practice of Inclusive Teaching (video)
<https://www.youtube.com/watch?v=UsLmQpFjRe0>
- Local Tribal Councils and other tribal resources
 - Malki Museum
- Google “decolonizing botany” or “colonialism ecological project”

Final kind of unrelated but kind of related thought

- Is our understanding of plants restricted by the language that we use?
- We can already see it is restricted by our need to name and categorize things
- What about the actual words we use for plant reproduction?
 - Does using terms from human/animal reproduction prevent us from understanding elements of plant reproduction?
 - Male and female plants
 - Male and female reproductive organs
 - Egg and sperm, male and female gametes
 - Ovary
- But the alternatives are very clunky
 - Pollen-bearing organ, microgametophyte
 - Megasporophyll, megaspore, megagametophyte – megagamete?
- What's a botanist to do??