

Leaves unseen, voices unheard: the false borders we draw and the futility of oppression and censorship in the plant sciences

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The following work was written by the author without the desire for institutional affiliation on Tallacua (Cráter la Alberca) in Camémbaro (Valle de Santiago), Guanajuato, México. The author thanks his husband and in-laws for providing a safe space to contemplate and write the following essay.

*And that a kelson of the creation is love,
And limitless are leaves stiff or drooping in the fields,
And brown ants in the little wells beneath them,
And mossy scabs of the worm fence, heap'd stones, elder, mullein, and poke-weed*

*...
A child said What is the grass? fetching it to me with full hands;
How could I answer the child? I do not know what it is any more than he.*

I guess it must be the flag of my disposition, out of hopeful green stuff woven.

*Or I guess it is the handkerchief of the Lord,
A scented gift and remembrancer designedly dropt,
Bearing the owner's name someway in the corners, that we may see and remark, and
say Whose?*

Song of Myself, Walt Whitman (1891)

Content warning: the following essay discusses and uses language about racial-, sexual-, and LGBTQ+-directed violence and erasure in the plant sciences.

Dear Editor,

I have measured the shape of many leaves. I've measured the leaves of grapevines, ancient symbols of wine and Dionysian fertility. I've measured the shapes of *Passiflora* leaves that evolve between species and metamorphose within vines to evade the egg-laying *Heliconius* butterflies. I've measured the shapes of cotton leaves, wide entire leaves and narrow leaves of the okra varieties, leaves that chafed and accompanied untold amounts of forced labor and human suffering. I hallucinate fantastic colors and shapes of Matisse cut-outs when I see *Monstera* leaves and I love and admire the mathematical patterns of phyllotaxy imprinted in the leaves of succulents, agaves, and cacti and their modifications, engorged with water or reduced to protective spines.

But these descriptions are not true leaves and I did not see *them*. And I did not measure their shape, only *a shape* I projected onto *them*. There are as many leaves as human beings that perceive them and yet nobody has known a single leaf. "Everything is a leaf" (*Alles ist Blatt*) and at the same time leaves are undefined, "that in the organ of the plant which we are accustomed to calling the leaf, the true Proteus lies hidden" (*daß in demjenigen Organ der*

Pflanze, welches wir als Blatt gewöhnlich anzusprechen pflegen, der wahre Proteus verborgen liege; Goethe, 1787). Even for those leaves glimpsed by only a single person, what of the untold leaves that fall in the autumn forests and respire in the evening fields never observed by anyone (or anything?). I once tried to measure all the leaves; a fool's errand, you might as well try to count all the stars in the sky. What would a leaf atlas look like? Would it have borders? I imagine the delineation of species, as slippery as the meandering path of the Mississippi over the centuries. I imagine a cartographer timidly outlining a region based on a leaf they saw only once, mistaken and exaggerated in its proportions. Undeniably, different people from fractured geographies and experiences would trace different borders. Do species exist, do borders exist? The uncharted regions of old maps—*Here be dragons*.

Originally titled *Freaks and the American Ideal of Manhood*, in his *Here be Dragons* Baldwin (1985) explores the artificially constructed border between male and female, between white and Black and of the grotesque ideal of American¹ masculinity that distorts the underlying co-existence of one and the other: the reality that we are all androgynous. American science, like American masculinity, is biased. Its declaration of objectivity and absolute truth is unfaithful to the undeniably multifaceted and abundant diversity of existence. American science, like its politics, builds walls through empty deserts where none exist and after doing so, looks inward to the arbitrary predilections of a small clique, denying the being of the world that falls outside. Baldwin ends his essay that this uniquely American fear of inextricably linked facets of humanity as *other* does not extinguish the fact of its existence, leading to cognitive dissonance and futile violence to achieve an unfulfilled prophecy. American science requires that contradictions to its dogma not exist, yet the people and their perspectives persist.

Truth is composite and based on diverse, non-mutually exclusive perspectives. Each of us holds a unique world view, both as individuals and as representatives of our cultures. The need of American science to prove or disprove demarcates lines between right and wrong, rational and irrational, civility and barbarism, where there are none.

The lines on our map of science were drawn by specific people with limited views. In the remainder of this essay, I argue that our currently distorted view of plant science is worse than simple bias: that it is maintained through discrimination, deportation, violations of individual autonomy and identity, suppression, and censorship. I mention three historically excluded groups in US science that I am either a member of or am peripherally involved with and use examples from personal experience: the Latinx and undocumented community, the LGBTQ+ community, and victims of sexual harassment that are forced to sign non-disclosure and non-disparagement agreements. Like the partial truth of science in its attempt to describe reality, intersectionality teaches that to truly understand oppression, we would consider all its axes and manifestations against individuals. As a white, cisgender, non-disabled USian man, these words suffer from the same distortion I am describing. But the oppression is real, and it has

¹ I use "American" to refer specifically to the United States and to remain true to Baldwin's writing despite the problems of its usage related to the topic of this essay—the US is not the only country that can claim the name of "America".

consequences. It leaves evidence that we, as scientists, can observe and document. And I argue, like Baldwin, that the attempt to deny the existence of people and their unique perspectives from the map of plant science is futile and through its perversion and grotesque violence only amplifies the actual truth and lays bare the folly for all to see.

DIVIDED BY RACE AND CULTURE

To see the borders we erect in science you only need to look around: Madzima and MacIntosh (2021) show the exclusion of Latinx and Black scientists in receiving PhD degrees compared to the overall US population. The origins of this exclusion run deeper: there is profound racial disparity within US agriculture, between those who do the labor and the industry and the academy that profit from it. Of US farm laborers, 57% are of Mexican origin and 46% are not US citizens (Figure 1, USDA, 2019). Within the US academy, this group is historically excluded, despite their labor sustaining the industry that we study. Many might lament the border wall and the xenophobia of the Trump administration, rather than take responsibility for the fact that half the people that toil, grow, and harvest the plants that we study and eat—who are separated from their loved ones and forced to traverse a deadly border under constant threat of arrest and deportation—are barely represented in our field of study. But we—scientists—are responsible for that wall too, and it is revealed in our everyday communications. Take for example an email message from a National Academy of Sciences member to the scientists of one of the most prestigious independent plant research institutes in the world regarding immigration restrictions shortly after President Trump took office in January 2017:

We believe that the Center is stronger when we welcome and embrace people who come from around the world, lawfully, to make meaningful contributions, and who bring perspectives and talents that enrich the Center, the region, and the nation. The flags that hang in the McDonnell International Gallery are there for a reason: to make a public statement that we value, honor and celebrate our international colleagues (Carrington, 2017).

Note the assertion that “the Center is stronger” when people from around the world are welcomed and the focus on making “a public statement”. But this only applies when people come “lawfully”; we are left to understand that the undocumented and the people that grow

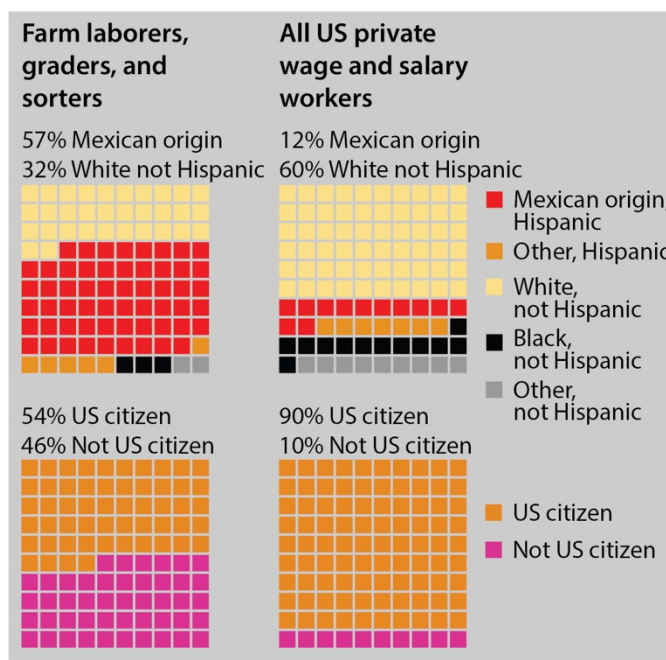


Figure 1: US agriculture demographic data. Waffle plots showing demographic composition of farm laborers, graders, and sorters (left) and all US private wage and salary workers (right). On top, demographic composition and bottom US citizenship status.

our food under exploitive working conditions are not welcome here, nor that their contributions to plant science can “enrich the Center, the region, and the nation”. It is five years ago from the time of this writing, but we must remember the larger context behind the message of the time, that by using the word “lawfully” Carrington was invoking legal threats of arrest and deportation through US Immigration and Customs Enforcement (ICE). “Undocumented” (like underrepresented) is not the best choice of words (not to condone either the connotations of the opposite of lawful implied in the message above). It is the white US citizens (including scientists) who have politically withheld documented status and created the inhumane working conditions in agriculture. Coming back to Baldwin, like his statement of the androgyny within each of us, the separation of white plant scientists from the Latinx agricultural workers is false: there is no plant science without agriculture and vice versa, and there is obviously no justification for the deep racial segregation between the two. The many and diverse cultures that comprise México have over millennia contributed infinitely more to agriculture—from the domestication of the world’s most important crops to sustainable cultivation practices that will be key in surviving climate change—than the US ever will. Rather, like the grotesque American masculinity of Baldwin, it is the white citizens of the United States who drew an arbitrary border, erected a wall, and arrested and deported countless people who were the very ones being exploited for their labor that plant scientists use to justify the importance of their research. White scientists at worse are responsible for enforcing and reifying this division, and at best passively benefiting from it. We know where the blame for the divided soul of US plant science lies, and it is not with México or the undocumented.

DIVIDED BY GENDER AND SEXUALITY

The inextricable link between the US and México, that permeates all facets of life including our relationship with plants, is the true state of things, but US white people must manufacture criteria to separate where no division is justified. Language, culture, and race are all used for this purpose. Oppression *discerns*: it is the *reason* that a group fabricates to justify its distinctness from and control over another. The statistics that we use in science are no different, founded to justify eugenics (Clayton, 2020). There must be *reasons* that scientists *study* and others are *studied*. How else to justify that they know “truth”, something impossible for any one individual to know? Baldwin describes that it mattered less that he was gay and more that it was discernable that he was not a “man”:

For what this really means is that all of the American categories of male and female, straight or not, black or white, were shattered, thank heaven, very early in my life. Not without anguish, certainly; but once you have discerned the meaning of a label, it may seem to define you for others, but it does not have the power to define you to yourself. This prepared me for my life downtown, where I quickly discovered that my existence was the punch line of a dirty joke. The condition that is now called gay was then called queer. The operative word was faggot and, later, pussy, but those epithets really had nothing to do with the question of sexual preference: You were being told simply that you had no balls. I certainly had no desire to harm anyone, nor did I understand how anyone could look at me and suppose me physically capable of causing any harm. But boys and men

174 chased me, saying I was a danger to their sisters. I was thrown out of cafeterias and
175 rooming houses because I was "bad" for the neighborhood (Baldwin, 1985).

176
177 Scientists love to see the invisible, discerning what others cannot. But in its application to
178 separate people and justify hegemony, it has a dark past that persists to this day, from
179 physiognomy to abuses of machine learning and digital technologies that are currently being
180 used to classify people. I offer a personal experience from the field of plant science: a senior,
181 renown, maize geneticist who committed sexual harassment (from the Academic Sexual
182 Misconduct Database; Libarkin, 2020) grabbed my hand at a bar in front of his former wife to
183 measure the ratio of the length of my index to ring fingers to see if I was gay, forcing my hand
184 up against his saying "c'mon Dan, let's see your ratio". I will not entertain or cite the "science"
185 behind the phenomenon above, only to say that it exemplifies the attempt to justify oppression
186 in the name of science of those who have sequestered power in our community over others, of
187 which I am trying to illustrate here. Field and Rajewski (2021) highlight the challenges facing the
188 LGBTQ+ plant science community, from a patchwork of legal rights available to some but not
189 others in the community to innumerable discriminatory barriers, including poverty, navigating
190 complex family situations, and unwelcoming classroom and laboratory environments. In the
191 recent past, LGBTQ+ erasure in the plant sciences has been explicit. Former Monsanto, now
192 Bayer, is the most powerful industry representative for our field. As documented in the
193 investigative journalism of Kavin Senapathy (2018, 2019), public relations specialist Vance
194 Crowe was hired as "Director of Millennial Engagement" to win over millennials to Monsanto's
195 efforts to modernize agriculture through technology. Monsanto through Crowe invited the alt-
196 right psychologist Dr. Jordan B. Peterson to a fireside chat with farmers at the 2018 American
197 Farm Bureau Federation conference in Nashville. Dr. Peterson was well known at the time for
198 his transphobia and desire to eliminate women's studies, ethnic studies, and sociology and
199 knew nothing about agriculture or farming. His fame amongst the extreme right during the time
200 of the Trump administration spearheading anti-trans sentiments sent a clear message of
201 Monsanto's relationship with the trans community.

202
203 It is disturbing that Monsanto would finance such hateful propaganda and trans erasure in our
204 community, but it is especially concerning because superficially it doesn't make any sense.
205 There is no connection between LGBTQ+ identity and agriculture. That Monsanto would finance
206 hate to appeal to a conservative farmer base is consistent with its profit motives, but still we
207 are left with the absurdity of *why*? In the previous section I discussed an actual geographic
208 border that divides by race and culture; the border I am discussing here cleaves within the
209 identity of individuals themselves, a violation of outsiders attempting to erase gender identity
210 and sexuality. Queerness is threatening, dangerous, and powerful. It is a challenge to
211 normativity. If the null hypothesis of society is to be straight, then the alternative is to be
212 Queer. As Baldwin describes, the threat of Queerness to Monsanto and the plant science
213 community reveals the grotesque need for American masculinity to dominate, its fear of the
214 feminine and Queer within itself and without which it cannot survive. Monsanto's stance was
215 clear: farming and plant science are not for faggots or pussys. Again, we come back to the
216 connection between plant science and stolen lands and racial and sexual dominance. Until we
217 acknowledge and discuss the truth of what has occurred, we will not move on.

218
219 **THE SILENCED, DEPORTED, AND ERASED: THOSE WHO ARE NOT HERE TO TELL THEIR STORY**
220

221 Death on the other hand, is the final silence. And that might be coming quickly, now,
222 without regard for whether I had spoken what needed to be said, or had only betrayed
223 myself into small silences, while I planned someday to speak, or waited for someone else's
224 words (Lorde, 1977).
225

226 I do not write this essay without fear. I have my reasons that I will not (cannot) detail further.
227 My problems started when I spoke and reported and this essay itself is my refusal to be
228 silenced or accept the violence inflicted upon me for speaking by the plant science community.
229 But I also have the least reason to be fearful, because of my whiteness, masculinity, cisgender
230 identity, non-disabled, and US citizenship status. I am here, and you are reading my words this
231 very moment. We cannot hear the voices of untold numbers—because they were silenced,
232 erased, or killed through racism and police violence or the negligence of scientific institutions to
233 respond to the pandemic appropriately (Montgomery, 2020).
234

235 To see this violence perpetrated by whiteness and masculinity, you need only to observe who is
236 among us and the mark of ~~underrepresentation~~ willful exclusion (Madzima and MacIntosh,
237 2021). Exclusion occurs everywhere and all the time, when we speak over colleagues or
238 mentees or yell at them, when we knowingly disparage the work of others out of insecurity
239 over our own, when we fail to cite and give due credit and praise where we know it is deserved.
240 Who we give grant money, degrees, tenure, and raises to and who we withhold them from,
241 who speaks at meetings and who doesn't, and who we give the benefit of the doubt. And it is
242 enforced through law, as well: through deportations and arrests, mandatory reporting and Title
243 IX, non-disclosure and non-disparagement agreements that silence victims and protect their
244 violent aggressors. If you doubt that such legal agreements are enforced or have violent
245 consequences against those who dare speak their truth, then you are mistaken (Rodríguez
246 Mega, 2021).
247

248 In the extended metaphor that is *Lessons from Plants* (Montgomery, 2021), Montgomery
249 (2020) elaborates on how plant growth informs us against a deficit-based mindset, where the
250 individual is judged by their phenotype, not considering the environmental conditions
251 responsible for modulating it. She furthers the analogy that, similar to how environmental
252 responses are modulated through signal transduction networks where environmental
253 conditions are perceived and lead to outcomes through network modulation, that similarly
254 there can be stewardship-based transduction, where STEM environments are perceived
255 through mentors and leaders that lead to outcomes through network building and cultivation.
256 For the examples discussed in this essay, mechanisms that protect institutions or prevent
257 feedback—non-disclosure agreements or violence that silences and erases individuals—would
258 break the link with “perception”. There can be no community network response because the
259 information flow is halted. To make another plant analogy, the silencing of individuals is like
260 plant viruses, which attack plant immune responses, preventing resolution or productive

response. If the ways that power silences and reifies itself in plant science are like a virus, our community will have to evolve resistance if we are to overcome the infection.

CONCLUSION

Would you know all the leaves? Would you know all the stories? We have no idea of the totality of truth and the true nature of things; none of us do. In this essay I argue that the plant science community itself can be responsible for erasing the knowledge we purportedly seek. Truth is what is known collectively by the community and yet hidden and guarded, and only revealed by choice and with autonomy and freewill, as experienced by each individual. I am as guilty as the rest. But I speak for what I know, I write as testimony from my experiences, even if under legal threat. And to those reading this who know of what I speak and are responsible: are you afraid of my existence, of what I have to say? Would you throw me out as “bad” for the neighborhood”? I suggest you look into your own distorted and divided soul, cleaved in two by the borders you willfully drew, that betrayed and exposed the Truth long ago.

Each of us is here now because in one way or another we share a commitment to language and to the power of language, and to the reclaiming of that language which has been made to work against us. In the transformation of silence into language and action, it is vitally necessary for each one of us to establish or examine her function in that transformation and to recognize her role as vital within that transformation (Lorde, 1977).

Conflict of interest statement: The author alleges he was forced to sign a non-disclosure and non-disparagement agreement by Donald Danforth Plant Science Center.

References

Baldwin, James (1985) *Here be Dragons* (originally titled, “Freaks and the American Ideal of Manhood”). Published January 1985 in Playboy. Retrieved from <https://www.cusd80.com/cms/lib/AZ01001175/Centricity/Domain/1073/Full%20Text%20Here-be-Dragons-James-Baldwin.pdf> on 24 January 2022.

Carrington, James (2017). “Statement from Jim Carrington”. Email sent January 29, 2017 to all Donald Danforth Plant Science Center employees. Retrieved 24 January 2022.

Clayton, A. (2020). How eugenics shaped statistics. *Nautilus, October, 28*. Retrieved 24 January 2022 <https://nautil.us/how-eugenics-shaped-statistics-9365/>

Field S, Rajewski A (2021) Challenges facing LGBTQ+ early-career scientists and how to engage in changing the status quo. *Plant Cell* 33: 1859-1862

Goethe, Johann Wolfgang (1787) *Italienische Reise*, “Neapel, den 17. Mai 1787”. Projekt Gutenberg-DE. Retrieved from <https://www.projekt-gutenberg.org/goethe/italien/ital2221.html> on 24 January 2022.

Libarkin, J (2020). Academic Sexual Misconduct Database. Incident 7310. Retrieved 26 January 2022 from <https://academic-sexual-misconduct-database.org/incident/7310>

Lorde, A (1977) The Transformation of Silence into Language and Action. Paper delivered at the Modern Language Association's "Lesbian and Literature Panel," Chicago, Illinois, December 28, 1977. First published in *Sinister Wisdom* 6 (1978) and *The Cancer Journals* (Spinsters, Ink, San Francisco).

Madzima TF, MacIntosh GC (2021) Equity, diversity, and inclusion efforts in professional societies: intention versus reaction. *Plant Cell* 33: 3189-319

Montgomery, BL (2020) Planting equity: Using what we know to cultivate growth as a plant biology community. *Plant Cell* 32: 3372-3375.

Montgomery, BL (2021) *Lessons from Plants*. Harvard University Press, Cambridge, MA.

Rodríguez Mega, E (2021) Cuando lo profesional se vuelve personal (When the profesional becomes personal). *Science* 374: 6563.

Senapathy, K (2018) Why Is Monsanto Inviting This Alt-Right Hero to a Fireside Chat on Farming? *Slate*. Published 4 January 2018. Retrieved 26 January 2022 from <https://slate.com/technology/2018/01/why-is-monsanto-inviting-alt-right-hero-jordan-peterson-to-a-fireside-chat-on-farming.html>

Senapathy, K (2019) Opinion: I Was Lured Into Monsanto's GMO Crusade. Here's What I Learned. *UNDARK*. Published 27 June 2019. Retrieved 26 January 2022 from <https://undark.org/2019/06/27/monsanto-gmo-crusade/>

USDA Economic Research Service (2019) Farm Labor. Retrieved 5 February 2022 from <https://www.ers.usda.gov/topics/farm-economy/farm-labor/>

Whitman, Walt (1891) *Leaves of Grass* (Philadelphia: David McKay, 1891-92): 29-79. PS 3201 1891 Robarts Library. Retrieved from <https://rpo.library.utoronto.ca/content/song-myself> on 24 January 2022.

Figure legend

Figure 1: US agriculture demographic data. Waffle plots showing demographic composition of farm laborers, graders, and sorters (left) and all US private and salary workers (right). On top, demographic composition and bottom US citizenship status.